The Boston University - Massachusetts Memorial Hospitals Medical Center

A PLAN FOR ITS PHYSICAL FUTURE

June 1962

Anderson Beckwith and Haible, Architects
11 Beacon Street
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ANDERSON BECKWITH AND HAIBLE ARCHITECTS
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June 1962

Dr. Lewis H. Rohrbaugh, Acting Dean
Boston University School of Medicine

Dr. Philip D. Bonnet, Administrator
Massachusetts Memorial Hospitals

Gentlemen:

This letter will transmit to you fifty-five copies of our report: The Boston University - Massachusetts Memorial Hospitals Medical Center, A Plan for its Physical Future, dated June 1962. In this document we have tried to summarize and interrelate the knowledge we have gained about the programming of future space needs of the Medical Center and to interpret them in physical terms on the site. The report is backed up with the memoranda of numerous meetings and interviews which are available in our file for reference if you wish.

We earnestly hope that means will be found to carry out the plan in such a way as to realize the full potentialities of the Center. Please call on us if clarification is necessary or if any further work on this matter appears useful in the accomplishment of your objectives.

Sincerely yours,

Lawrence B. Anderson
Anderson Beckwith and Haible

LBA/jh

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I. INTRODUCTION

This study has been proposed for the Joint Administrative Board of the Medical Center, and was authorized by Dr. James M. Faulkner as Director of the Medical Center on February 8, 1961.

The objectives, as set forth at the outset of the study, are three-fold:

1. To develop in some detail information about the present facilities, the activities requiring new facilities, and the needs for replacement and expansion of the elements of the Medical Center and to assess in a more general way the space needs of existing and proposed associated medical institutions in the immediate district.

2. To study the characteristics of the environment of the center to determine the availability of land, the possibilities for adjustments in street location, and the relation of the future needs of the Center to prospects for urban redevelopment in the South End.

3. To prepare illustrative design plans to serve as guides to land acquisition, siting of the general elements, general circulation and parking, and adjoining land uses.

The background for program, facilities and needs of the Medical Center proper was developed through interviews with the following:

Dr. Lamar Soutter	Dean of the School (to August 1, 1961)
Dr. Lewis H. Rohrbaugh	Acting Dean of the School
Dr. Edgar Baker	Professor of Microbiology
Dr. Henry Bakst	Professor of Preventive Medicine
Dr. Bernard Bandler	Professor of Psychiatry
Dean Marie Farrell	Professor of Nursing
Prof. Mary Ann Garrigan	Professor of Nursing
Dr. Sydney Gellis	Professor of Pediatrics
Dr. Henry Goldman	Professor of Stomatology
Dr. Arthur Lassek	Waterhouse Professor of Anatomy
Dr. Earl Loew	Professor of Physiology
Dr. G. K. Mallory	Professor of Pathology
Dr. Peter J. Mozdan	Professor of Obstetrics and Gynecology
Dr. Langdon Parsons	Professor of Obstetrics and Gynecology

Dr. Edward Pelikan	Associate Professor of Pathology
Dr. Stanley L. Robbins	Professor of Pathology
Dr. F. Martin Sinex	Professor of Biochemistry
Dr. Reginald Smithwick	Professor of Surgery
Dr. Sheldon Sommers	Associate Professor of Pathology
Miss Florence Turner	Librarian
Dr. Robert Wilkins	Professor of Medicine

Dr. Philip D. Bonnet was consulted on problems of hospital administration and Mr. Herbert D. Klein for utilities and physical plant conditions. Mrs. Charles Gowing gave assistance on student housing. Liaison with Boston University occurred through Mr. Kurt M. Hertzfeld, Vice President for Administrative affairs, and Mr. Charles Woodman, planning officer. Consultations were held with Mr. Donald Graham, Mr. Richard Beatty, and Mr. Traunstein of the Boston Redevelopment Authority. Information regarding the Mental Health Center was supplied by Dr. Solomon, Director of the Mental Health Department of the Commonwealth.

II. ELEMENTS OF THE CENTER

THE BOSTON UNIVERSITY SCHOOL OF MEDICINE (BUSM) and
THE MASSACHUSETTS MEMORIAL HOSPITALS (MMH)

By their affiliation, under which MMH functions as the teaching hospital for BUSM, these two institutions officially constitute the Medical Center.

The strength of the Center is increased by the presence of the Boston City Hospital and the projected presence of the Massachusetts Mental Health Center and the Booth Memorial and needs of these agencies must be taken into account in the overall plans.

THE MEDICAL SCHOOL

BUILDINGS A, B, and C

The Medical School Buildings were erected between 1900 and 1912. Building A contains the major administrative offices, the library, a much-used lecture room for 200, and some research space. Buildings B and C contain a variety of teaching and research space in the form of general and specialized laboratories.

THE HOSPITALS (MMH)

TALBOT MEMORIAL

This building, dating from 1876, is the original building of the Massachusetts Homoeopathic Hospital. It serves presently as an out-patient clinic and center for home care to residents of the area. In addition to the clinics, the extensive Medical Center engineering service facilities and teaching space for the Nursing School are located in the Talbot Building. Additional outpatient facilities, for private patients, are located in the Medical Associates Building, 203 Commonwealth Avenue, Boston, Massachusetts.

ROBINSON, COLLAMORE AND EVANS MEMORIAL

Bed patient care, for a capacity of 250, is housed in the Robinson, Collamore and Evans Memorial buildings. Robinson, the oldest, was built in 1907. Its lower floors contain services and administrative functions. The upper floors house patient care facilities for psychiatric, surgical, rehabilitation, and obstetrical patients. Collamore, built in 1935, has much the same organization and the two have the same floor levels. Evans was built in

1941 with a gift by Mrs. Robert Dawson Evans. It is a privately-endowed institution for clinical research. Along with this function, Evans contains the central kitchen and staff dining areas, the major operating suites and patient care facilities for medical patients. Evans has recently been remodeled by removing residence facilities on part of a floor and installing, in its place, a small pilot intensive care unit. The upper floor viewing amphitheatres, no longer essential in teaching, have been converted to laboratory facilities.

NURSES' RESIDENCE

VOSE HALL

Vose Hall, built in 1907, is primarily a nurses' residence. In recent years parts have been converted to house some of the administrative functions of the Medical Center.

RESEARCH FACILITIES

NEW RESEARCH BUILDING

The most recent building in the Medical Center is the New Research Building. It was built in 1960 with the help of funds from the Federal Government. It is used exclusively for staff research. It can be expanded vertically by three stories.

STOUGHTON BUILDING and 68 EAST NEWTON STREET

The Stoughton Building and 68 East Newton Street were both built in the 1890's and acquired by the Medical Center in 1951 and 1959 respectively. Certain research facilities are now provided in the Stoughton Building for pharmacology, cardiovascular, pharmacy, pathology and cancer research. 68 East Newton is used for the teaching of stomatology.

POWER PLANT

The Hospital Power Plant is equipped with three boilers installed in 1941. The plant heats both the Hospitals and the Medical School. The plant generates electricity as a by-product and serves the Hospital electrical demands. It operates as a compact, economical unit with only a small excess capacity.

ASSOCIATED INSTITUTIONS

MASSACHUSETTS MENTAL HEALTH CENTER

The Department of Mental Health of the Commonwealth of Massachusetts, in agreement with the Department of Psychiatry of BUSM, proposes to construct a new Center for treatment, research and training, associated with the Medical Center. This institution would provide a major facility for carrying into practice new methods for the treatment of mental illness. Plans prepared for the Commonwealth indicate a proposed gross floor area of 280,000 square feet.

BOOTH MEMORIAL

The Salvation Army proposes to build an institution to care for unwed mothers, associated with the Medical Center. The project is now seen as primarily residential, depending on Massachusetts Memorial Hospitals for delivery room facilities and therefore demanding close proximity. It would include examining rooms for prenatal and followup care. The capacity would be 30-50 beds.

BOSTON CITY HOSPITAL

The Boston City Hospital, a municipal institution, is built on a sixteen-acre tract adjoining the Medical Center across East Concord Street. Major buildings were erected between 1861 and 1937. It has 1100-1150 beds and is used as a teaching hospital by all three medical schools in the City. The Medical Center, which has a newborn nursery but no pediatric department, depends on the pediatric facilities at the Boston City Hospital for teaching in that area. The Pathology Department of the Medical School uses the facilities of the Mallory Institute for 3rd year clinical studies.

Although obsolescence of facilities and high administrative and operating costs have raised questions about the future of the Boston City Hospital, it seems likely to continue indefinitely in this location.

TABULATION OF EXISTING FACILITIES

Building	Year Built	Condition*	Gross Area	Out-patient	Bed-patient	Predominant Uses Teaching	Research	Residential
Talbot Central	1876	D	21,000	X				
Talbot Surgical	1883	D	32,000	X		X	X	
Talbot Medical	1883	D	22,700	X				
68 E. Newton Street acquired in 1959	1890	D	2,000			X		
203 Commonwealth Avenue acquired in 1951	1890	B	14,000	X				
Stoughton	1900	C	6,000				X	
Buildings BC	1900	C	36,000			X		
Robinson Memorial	1907	D	53,000		X			
Vose Hall	1907	B	28,000					X
Building A	1912	B	25,000			X	X	
Collamore Memorial	1935	C	33,300		X			
Evans Memorial	1941	B	70,000		X		X	
Power Plant	1941	A	5,000					
New Research Building	1960	A	80,000				X	
			428,000					

* A through D indicates the rank of condition from highest through lowest.

PRECLINICAL TEACHING AND RESEARCH FACILITIES

EXISTING SPACES

Department	Academic Facilities & Services	Teaching Laboratories	Offices & Research Laboratories	Total
Medical School				
Administration	3,250			3,250
Library	3,650			3,650
General Teaching	2,800			2,800
Personnel Services	3,300			3,300
Plant Services	2,400			2,400
Nursing School				
Administration				
Library				
General Teaching				
Personnel Services				
Laboratory				
Anatomy		280	5,300	5,580
Biochemistry		370	5,300	5,670
Microbiology		2,200	4,450	6,650
Pathology		1,850	2,000	3,850
Pharmacology		550	2,500	3,050
Physiology		2,750	3,450	6,200
Animals		1,500	3,000	4,500
Net Total n.s.f.	15,400	9,500	26,000	50,900
Circulation & Mechanical	4,600	3,500	21,000	29,100
Gross Total g.s.f.	20,000	13,000	47,000	80,000

PATIENT CARE

AND CLINICAL RESEARCH

EXISTING SPACES

Department	Research	Bed Care & Services	Ambulatory	Cent. Diag. & Treatment	Total
Medicine	25,500	11,500	20,000		57,000
Surgery	10,600	22,600	comb. w/med.		33,200
Surgical Dept.				9,700	9,700
Obstetrics	450	4,000	1,200		5,650
Delivery				3,800	3,800
Gynecology	Incl. with obst.	Incl. with surgery	Incl. with obst.		
Pediatrics	400	800			1,200
Prev. Med.		3,600			3,600
Physical Ther.				5,750	5,750
Home Med. Ser.				2,300	2,300
Psychiatric	9,800	5,400	4,200		19,400
Stomatology			2,900		2,900
X-ray & Rad. Ther.				4,150	4,150
Cardiog. & Basal Metab.				1,200	1,200
Necropsy & Histology				3,700	3,700
Service Labs				2,200	2,200
Pharmacy				1,200	1,200
Teaching Space					
Admin. & Admit.		12,050	1,200		13,250
Central Services		16,840			16,840
Personnel Serv.		660			660
Dietary Serv.		8,050			8,050
Employees Clinic			1,000		1,000
Net Total n.s.f.	46,750	85,500	30,500	34,000	196,750
Circ., etc.	43,000	30,000	32,600	17,000	122,600
GROSS TOTAL g.s.f.	89,750	115,500	63,100	51,000	319,350

OTHER FACILITIES

EXISTING SPACES

Department	Total g.s.f.
Power Plant	5,000

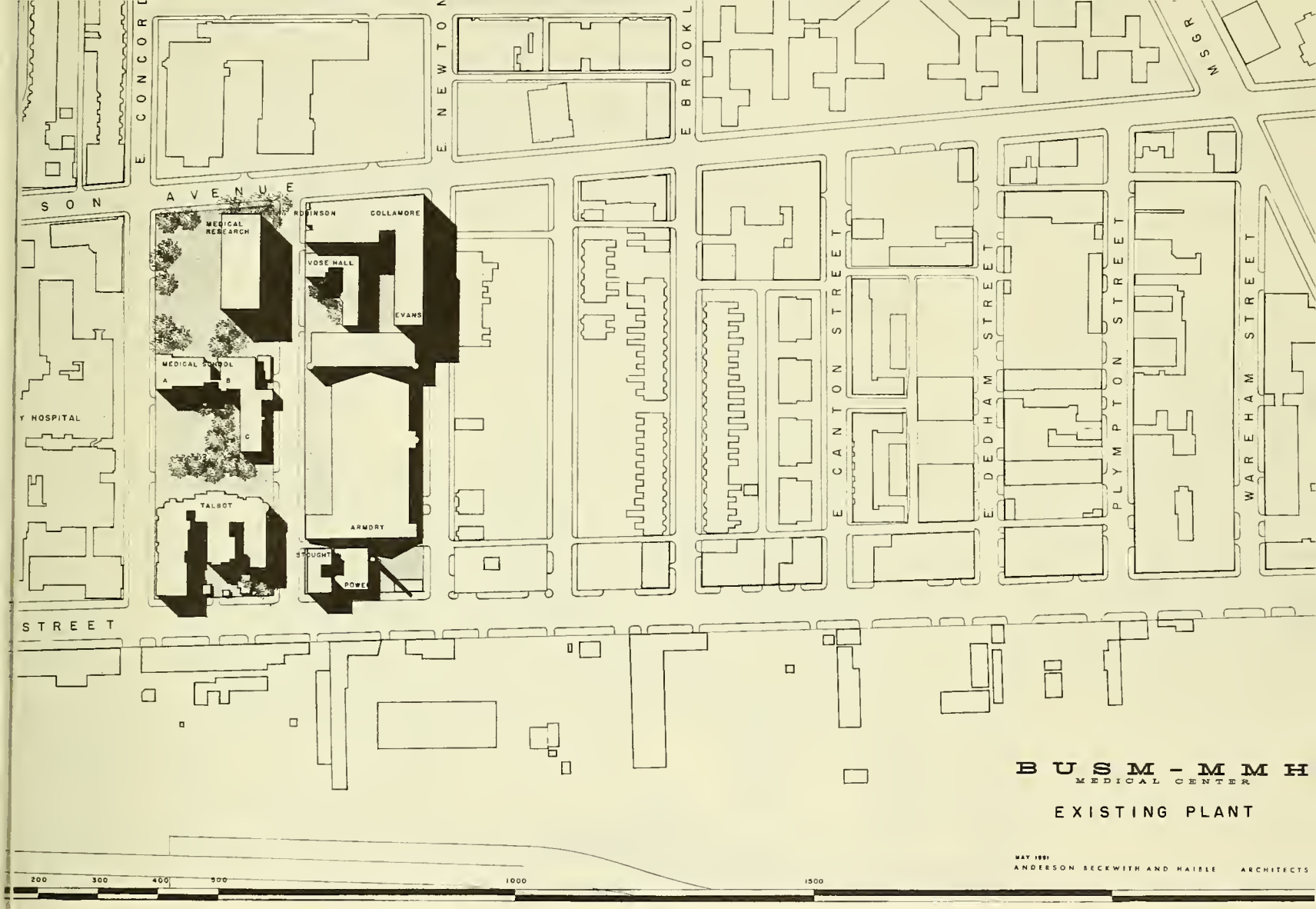

E. CONCORD
E NEWTON
E BROOKL
MSGR
SON AVENUE
MEDICAL RESEARCH
ROBINSON
COLLAMORE
VOSE HALL
EVANS
MEDICAL SCHOOL
A
B
C
Y HOSPITAL
TALBOT
ARMORY
STOUGHT
POWER
STREET
E CANTON STREET
E DEDHAM STREET
PLYMPTON STREET
WAREHAM STREET
BUSM - MMH
MEDICAL CENTER
EXISTING PLANT
MAY 1991
ANDERSON BECKWITH AND HAIBLE ARCHITECTS
200
300
400
500
1000
1500

Figure 1

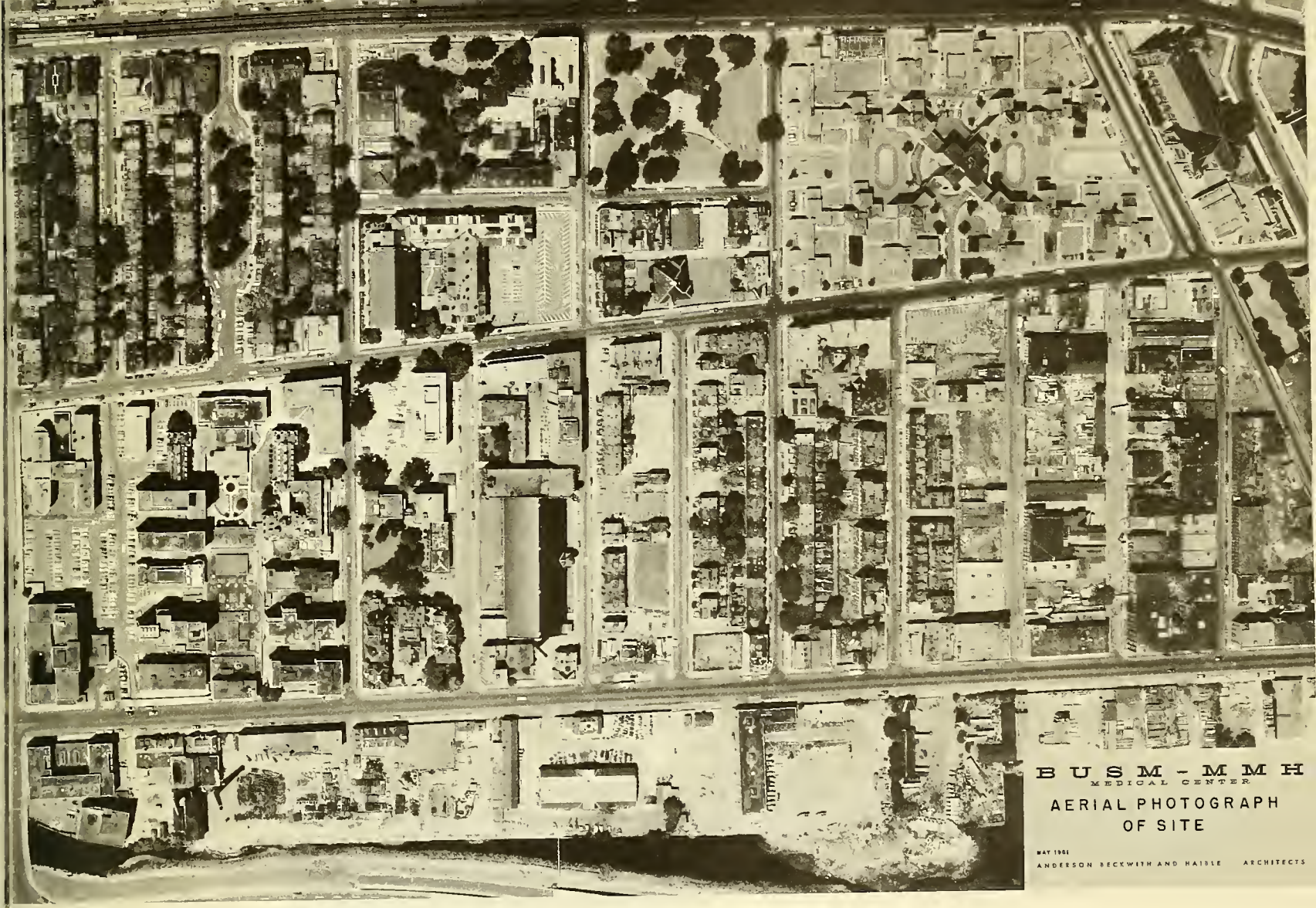

B U S M - M M H
MEDICAL CENTER
AERIAL PHOTOGRAPH
OF SITE
MAY 1961
ANDERSON BECKWITH AND HAIBLE ARCHITECTS

Figure 2

III. A QUANTITATIVE ANALYSIS OF BOSTON UNIVERSITY SCHOOL OF MEDICINE and MASSACHUSETTS MEMORIAL HOSPITALS

These two institutions combined have added to their total space in almost every one of the last ten decades and now have a gross total of over 400,000 sq. ft. or ten acres of floor space. Having accumulated these facilities over such a long period, the institutions are today involved with problems of replacement as well as with growth and change. A number of buildings have become so obsolescent as to impair the effectiveness of the program. Increasingly rapid growth of medical knowledge and the changing role of the institutions obliges expansion and the inauguration of activities new to the Center. Relationships with the community are changing rapidly and the entire district of the city surrounding the Center is in need of renewal. The combination of all these factors presages a new period of growth for the Center and will require continuous overall planning to relate and control the many influences that need consideration.

For convenience the space accommodations and needs will be discussed under the following headings:

Residential

Preclinical Teaching

Clinical

- Ambulatory
- Bed-patient

Research

Circulation and Parking

At many points, however, these areas are not really extricable one from the other and one must remember that all the activities indicated by the classification are very closely associated. Moreover, another kind of classification is equally important, that of defining subject matter or field. For example, surgery is a field that cuts at right angles through the headings above. The need to promote the separate integrity of each such field is an important planning consideration.

RESIDENTIAL

The Medical Center owns at present no facilities suitable for residential use, but intends to build dormitory and apartment accommodations to house some of the medical and nursing students and young staff members. This project has been studied in sketches dated February 1961 by Perry, Shaw, Hepburn, and Dean, but further studies were suspended pending selection of a site.

In this report it has been assumed that the contemplated project represents the correct and appropriate housing accommodation to be institutionally owned and to be made part of the master plan. However, the residential problem has many aspects, some of which can be put forward here in order to emphasize the complexity of the problem and the need for far-sighted policies to solve it. If this part of the South End could become a better residential community the problem would take care of itself; without such change the provision of a few dormitories may fail to create good housing for their tenants.

In November and December 1961 the Boston University Planning Office conducted a questionnaire survey on housing and parking among personnel of the Medical Center and Boston City Hospital. Analysis of the results, made available in April 1962, helps toward an understanding of the larger problem. The survey attempted to discover how many people would be interested in living "in a pleasant atmosphere" near the Medical Center.

We have also been able to make an analysis of the present residential habits of the medical student groups, and this is helpful in emphasizing the shortcomings of the immediate environment as a place of residence.

In any housing policy there are several groups to be considered.

Medical Students are the group for whom the Center feels the greatest responsibility. Figures 3 and 4 show where BU medical students are living today. 37 per cent of these students are married. A tabulation of distances from residence to campus for both married and single students follows:

	married	single
within 1/4 mile	8	83
1/4 -- 1 mile	0	7
1 -- 2 miles	28	23
2 -- 4 miles	36	36
4 -- 8 miles	17	16
beyond 8 miles	10	6
	99	171

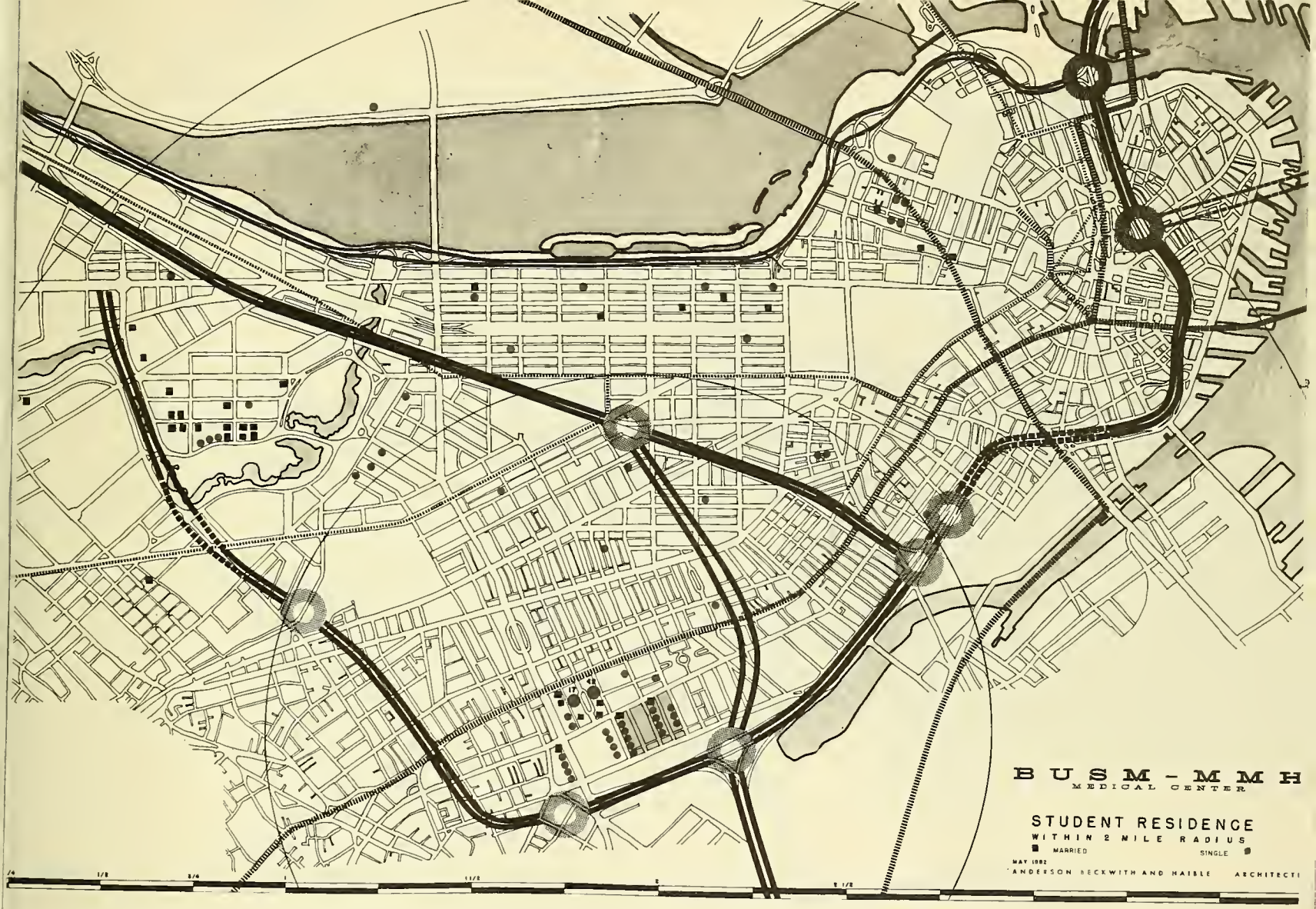

BUSM - MMH
MEDICAL CENTER
STUDENT RESIDENCE
WITHIN 2 MILE RADIUS
MARRIED
SINGLE
MAY 1982
ANDERSON BECKWITH AND HAIBLE ARCHITECTS

Figure 3


METHUEN
WAKEFIELD
SALEM
MARBLEHEAD
MOBURN
SAUGUS
LYNN
SWAMPSCOTT
LEXINGTON
WINCHESTER
MELROSE
MALDEN
NAHANT
ARLINGTON
REVERE
BELMONT
WATERTOWN
BOSTON
BROOKLINE
NEWTON
WELLESLEY
NEEDHAM
DEDHAM
MILTON
QUINCY
NORWELL
N ATTLEBORO
SE EXPRESS
BRAINTREE
WEYMOUTH
BUSM - MMH
MEDICAL CENTER
STUDENT RESIDENCE
BEYOND 2 MILE RADIUS
MARRIED
SINGLE
MAY 1962
ANDERSON BECKWITH AND HAIBLE
ARCHITECTS

Figure 4

The tabulation suggests that about half of the unmarried students are willing to tolerate living conditions offered in the immediate area in order to be within walking distance of the school, but that only a very few married students find existing local conditions acceptable. The range 1--4 miles includes areas of the city where small apartments and rooming houses suitable for students are presently available in quantity. The 15 per cent of students living beyond 4 miles are probably living for the most part in their communities of origin.

Plans for student housing must provide for the needs of an expanded medical school. In the initial program of the new 6-year curriculum, it was proposed to have the students in residence on the medical campus during the first two years as well as later, to facilitate a more complete integration of the curriculum. This intention has now been abandoned, at least temporarily pending further evolution of the curriculum. Consequently the total student population should be considered as 4 x 120 = 480. On a national average, about 60 per cent of all graduate students are married, and the ratio is expected to increase. The present BUSM percentage is substantially less than this. As the school goes into its 6-year program its students will be younger. Probably the married students should be estimated in the range 35--40 per cent of the total.

Many medical students have lodging in connection with part-time employment, and others are living with relatives. There will always be a fraction who will insist on housing themselves independently of any institutional sponsorship. Perhaps under ideal conditions 2/3 of all medical students would live in facilities provided on the medical campus, or close at hand. In the survey conducted by the Boston University Planning Office, 70% of medical students responded and of these 78% would "move" or "perhaps move" to the area.

Nursing Students have a similar housing problem; the first two years of their four-year program will be primarily at the river campus; it will be desirable to have housing available on the medical campus during the third and fourth years, as well as for graduate students. The numbers involved appear to be 200 undergraduates, 100 graduates. Ratio of married students is not known, but should be assumed to be very low for undergraduates, substantially higher, perhaps 35-40 perccent for graduate students. In estimating the demand for apartments, account should be taken of the wish of single students to form small cooperative groups living together family style with shared housekeeping responsibility. Women are more likely to find this attractive than men, though both sexes show interest in such accommodations.

Women students are also probably more willing to accept institutional protection in an unsafe or unattractive urban environment than are men, and some estimates suggest that as high as

80 per cent of unmarried nursing students should be provided with sponsored housing. However, in the BU survey mentioned above only 51% of School of Nursing respondents would "move" or "perhaps move".

Interns and Resident Fellows need residential facilities nearby and a small number need very close accommodation for certain periods when they are on call. The total number in this category for BUSM-MMH is approximately 250; the number who must live very close in any case is about fifty. We may assume that 50 per cent of this group are married.

Working Nurses in MMH also need living accommodations. The nursing population is about 200.

The residence needs of the Teaching and Research personnel are hard to estimate. Most senior staff with families will probably prefer to live in other communities no matter how attractive the medical community can be made. Nevertheless there are many potential exceptions. The same is true of Other Staff of the hospital.

Patients and their Relatives who come from out of town often need a place to stay conveniently near the treatment center. This need is growing with the pace of research, the appearance of new methods of treatment for specific diseases, and the increasing ease of getting quickly to Boston from anywhere in the world. While housing for these visitors is less directly the responsibility of the Medical Center than housing for its students and staff, proper accommodation could be an important factor in the effectiveness of the institution.

As we move into more peripheral areas, some consideration should be given to the housing needs of the other medical agencies in the Medical Center, since it is possible that good solutions will develop which will embrace the total need. A 1957 study by Shepley, Bulfinch, Richardson, and Abbott of the long-term needs of Boston City Hospital recommended new housing for 500 staff officers, 500 nurses, and an unspecified number of apartments for married staff.

Housing needs generated by the State's Mental Health Center and the Booth Memorial will also be an important part of the problem of a residential community for medical people, but any figures given here must be highly conjectural as the information to estimate them is not available. They are, however, included in our Summary in order to have some conception of the possible total.

The BU Planning Office questionnaire went to all present personnel of BUSM-MMH and BCH, 5801 persons. Total responses were 2042, and 835 of these would "move" or "perhaps move"

to the area. 403 of the persons interested in being housed were BUSM-MMH personnel, 432 were BCH. While only a minority of the total personnel replied to the questionnaire, the potential market for medical housing is not necessarily limited to the 835 above, and might be guessed as 1200-1500.

Under the future conditions for which plans are being made, total personnel will grow to 8 or 10 thousand. Even if only 25% would ultimately be attracted to live in the community, this would be 2000-2500 or nearer 4000 persons counting dependents. While extrapolations such as these are very conjectural, the following breakdowns may add to plausibility.

Summary of projected residential needs:

	total	% housed	number housed	married	single
Medical Students	480	67	320	128	192
Nursing Students	300	67	200	30	170
(Item 1) Total BU students	780		520	158	362
Interns and Fellows	250	50	125	62	63
Working Nurses	200	50	100	30	70
Teaching and Research	800	12	100	60	40
Other Staff	500	20	100	60	40
(Item 2) Total BUSM-MMH personnel	2530		945	370	575
N.B. The presently programmed residential project provides accommodation for 92 married, 224 single personnel.					
Parents and Relatives			50	50	
Boston City Hospital					
doctors	720	25	180	90	90
nurses	600	50	300	50	250
other staff	2500	20	500	300	200
Mental Health, other			300	200	100
(Item 3) Total Medical Community			2275	1060	1215

One of the most interesting features of the BU Planning Office Survey is the overwhelming preference expressed for apartments as against rooms or dormitories. The responses were not correlated with marital status, but it is apparent that the ratio of choices (706 for apartments, 104 for room or dormitory) is such as to include large numbers of single persons favoring apartments. This is probably a reflection of the desire for independence from institutional authority on the part of mature professional students and other single personnel.

To house a single student in a college dormitory with its ancillary facilities requires (on a national average) 250 sq. ft. and costs $5000. We believe that small apartments suitable for young married couples some of whom have small children will require per family about 750 sq. ft. and cost about $15,000 each. Such apartments could also house groups of 2, 3, or 4 single students living together at about the same cost as in dormitories. Whether apartments or dormitories does not seem to change the area or cost materially.

Using these approximate area and cost estimates, and multiplying each married member of the hospital community by 2.5 to obtain the approximate total including dependents, the following tabulation results:

	persons	area	cost
(Item 1) BU Students	757	189,250	$3,785,000
(Item 2) BUSM-MMH	1500	375,000	$7,500,000
(Item 3) Total Medical	3865	966,250	$19,330,000

The total potential medical residential community, including dependents, would require a substantial amount of land. A floor area ratio of 2 would require over 10 acres, but no doubt could be worked out satisfactorily using primarily elevator-served buildings. With 15 - 20 acres it would be possible to have larger open spaces and to include more walk-up type of accommodations.

It must not be assumed that facilities already existing in the neighborhood are wholly unsuitable for meeting part of this need. We may discount any housing located between Harrison Avenue and Albany Street as almost surely this will be scheduled for removal. (See Chapter IV). The Worcester Square area is a little less close to BUSM - MMH, but Worcester Square itself now houses a substantial number of students, and this group of buildings appears to be the only residential complex in the immediate vicinity that has some

possibility of survival through rehabilitation. Whether its retention is justifiable will depend on the policy of the Boston Redevelopment Authority following its detailed study of the entire South End. What are the capabilities of Worcester Square to house the medical community?

On a piece of land totalling a little over 3 acres (including the central open space) there are some 40 town houses each about 25 ft. by 40 feet, 4 stories and basement. There are two large and two small rooms on each floor. 19 single men students, members of the medical fraternity AKK at 16 Worcester Square, now reside in one of these houses. Although not well-furnished and inadequate as to plumbing, the space per student is sufficient. With substantial internal modifications such a house would probably subdivide into from 4-8 small apartments. Thus Worcester Square has a maximum potential capacity of 760 single students or about 240 apartments, or some combination of both.

The entire Worcester Square district, bounded by Washington Street, East Concord Street, Harrison Avenue, and Massachusetts Avenue, has an area of about 10 acres and contains about 100 houses in addition to the 40 in the Square itself. However, these houses are smaller and generally in much poorer condition. Along Harrison Avenue and especially along Washington Street, the blighting influence of these heavy traffic streets is particularly noticeable.

Determining a housing policy may be one of the most puzzling problems facing the Medical Center. Policy must be influenced by what is expedient and possible in relation to clearly seen needs. For example, Federal financing is available for student housing under certain conditions. On the other hand when one asks what kind of residential community is needed ultimately to meet the wider problem, the answers are not easily apparent. Many of those who need housing, including students, resent excessive paternalism and the restrictions and controls that may be necessary in institution-owned quarters. Yet if this is to be a great Medical Center, there should ideally come into existence a residential environment where all participate because of common interests and enjoyments, where the young and eager can freely mingle with the old and wise, and where people in different fields can by association come to feel a shared social purpose. This will be difficult, particularly with so little on the site, with which to begin.

Although the master plan recommended in this report will show housing only for the BUSM-MMH specific needs already programmed, we believe that the overall problem of residence should be a matter for continued careful study by the faculty and administration.

PRECLINICAL TEACHING

In this category will be included all of the facilities connected with instruction that is distinct from clinical experience. Two groups of students are to be served, Medical and Nursing, both groups having a main body of students in a professional program and in addition a category of graduate students.

The Nursing School will require less space per student than the Medical School, since the students spend their first two years at the river campus in academic studies, and tend to concentrate primarily on clinical service during their residence at the medical campus during the final two years. Nevertheless a substantial amount of teaching space will be required for the undergraduates, and graduate study facilities may become quite important as well. Office spaces will be needed for the faculty, and lounge, locker, and other services for the students. It is intended that the Nursing School facilities be such as to require no sharing with the Medical School, except that the nurses will use the central library. Planning is to allow for 100 students per year class (2 years = 200) plus 100 graduate students. There are at present no facilities for these uses at the medical campus, because the four-year program is new. Hence there is a high priority on providing this school's facilities.

The spaces needed by the Medical School are broadly divisible in two types: laboratory and non-laboratory. This classification suggests itself because of the technical differences in the types of space required. Other things being equal, it would be desirable both economically and otherwise to avoid putting non-laboratory uses in a building equipped with laboratory services. Non-laboratory space includes the school administration, the library, lecture rooms and classrooms, offices for the faculty, and personnel services for students and faculty. Laboratory spaces are based on the medical curriculum which presents programs, largely concentrated in the two preclinical years, in six more or less equally important underlying sciences: anatomy (gross anatomy and microanatomy), pathology (including clinical pathology), microbiology, biochemistry, physiology, and pharmacology. In addition the medical student has a substantial component of instruction in psychiatry, though not on an equivalent laboratory level. Graduate students, in smaller numbers, usually scientists rather than post-M.D.'s group themselves around each of the medical sciences, and the rather new field of stomatology; the latter is a graduate study built on a professional degree in dentistry (not otherwise represented at BUSM). This course also requires some laboratory space for instruction.

The immediate urgency for rehousing preclinical teaching in the Medical School arises from the adoption of a 6-year combined academic and professional program, and in addition the intention to expand the size of the school from its present 72 students per class to the

range 100-120 students per class (plus a few graduate students). The school has had no space increments in a half-century, and its present quarters are not only obsolescent in quality but grossly inadequate in size for present enrollments, as may be seen by comparing the present areas with projected areas (Appendix I).

The programming of space for laboratory instruction in the preclinical sciences presents baffling problems of space utilization. If each of the six sciences is to have a laboratory with a capacity equal to the class size of 120, 720 individual laboratory work spaces will have been provided for 240 students, and the utilization factor will be less than 33 per cent. This is not as inefficient as it seems, because much time is needed to set up the materials for study and to clean up afterward, during which the students are at work in another science. Moreover deliberately to plan laboratories for maximum sharing between different sciences freezes the curriculum and inhibits experimentation with new teaching sequences. The medical curriculum seems in a constant state of reexamination and reorganization, and the advantages of having a separate laboratory for each field are great. This also permits simpler administrative arrangements, in that the appropriate offices and support space may be located adjacent to the home laboratory.

In the category of non-laboratory space there are two areas of great need. Lecture room facilities are completely inadequate and the library has for years been increasingly hampered by lack of growth space. In two more years over half of library materials will be in storage (including all medical journals prior to 1950). A seven-fold increase in library space is needed during the growth period envisaged in this study.

The site logistics of the Medical School offer little choice of location, since new building must be available before anything existing can be demolished. Just north of the present buildings there is room for a new structure having about 12,600 sq. ft. per floor, extending east-west from East Concord Street to Stoughton Street.

Because of the desired intimate relationship between teaching and research it is proposed to house the teaching laboratories in this new building, which can be matched at all floor levels with the new Research Building. On October 23, 1961, the authors of this report presented a summary of area needs for the Medical School to a Committee on an Instructional Building. Dr. Edgar Baker, chairman of that committee, submitted to Dean Lewis Rohrbaugh on December 8, 1961, a proposal for the elements to be included in a new building. This proposal was based on the previous summary as reviewed and revised by him and the departments concerned. The following facilities are proposed for this new building:

1. Separate laboratories, support space, and offices for each of the following: anatomy, pathology (laboratory shared by microanatomy), microbiology, (laboratory shared by clinical pathology), biochemistry, physiology, pharmacology.

2. Animal hospital and other central services.

3. Offices and teaching space for psychiatry and stomatology.

4. New lecture rooms.

5. The School of Nursing.

6. Medical student personnel services.

When this building is occupied it should be possible to demolish Buildings B and C, and to expand the library and administration within Building A. Later an additional academic building would be built on the site of Buildings BC, and ultimately this would be enlarged to replace Building A. At that time none of the present academic buildings would remain and the desired total areas would be satisfactorily provided for.

Included in these areas is a central lecture auditorium large enough to seat the entire Medical School and attraction for medical meetings of many kinds, as well as space to allow the library to grow into an important research center. The plan for the non-laboratory academic building can be kept flexible so that if need arises the School of Nursing or the lecture rooms initially provided in the teaching laboratory building can be moved to the academic building, thus allowing for a possible increase of laboratory space over the years.

A student union building might well be built near the academic building, so that social activities and some food services could be conveniently near the lecture rooms and library. This would facilitate better use of some of these spaces for extracurricular events. Alternatively, the union could be located in the heart of a residential center, if this is consistent with the final residential plan adopted. The union, or some similar facility under a different name, appears necessary to provide the social milieu for the informal scientific and professional exchange described in the 6-year curriculum.

CLINICAL--AMBULATORY

The urgent need to replace the long-obsolescent outpatient facilities in Talbot, the Medical Center's oldest building, seems to have triggered the intensive concern for the Center's physical future of which the current study is a symptom and a part.

In a report to the Executive Committee of the MMH dated June 21, 1960, the Ambulatory Services Committee summarized the need for a building of 80,000 sq. ft. to centralize all facilities for ambulatory care. Apparent, at that time, was the need to build close to the rest of MMH and this raised the problem of the Armory site. It became clear that a decision for the location of the Ambulatory Services Building requires a definitive resolution of the ultimate land uses in the entire area.

After many years of inefficient functioning in scattered locations, there is no point now in building new facilities for ambulatory patients, thus fixing conditions for the next generation of practitioners, unless this new construction promises to fit into a plan where in the long run all patient care and diagnostic services can be brought together. In this centralized plan, patients, whether ambulatory or not, in each area of medicine (i.e. surgery or industrial rehabilitation) would be grouped with their appropriate services under the supervision of the staff of that department, with teaching and research also close at hand.

The overall area of 80,000 sq. ft. for ambulatory services was arrived at by the Ambulatory Services Committee, using as a base the areas then in use for the planned services, and allowing for expansion consistent with growth of the Medical School. Services to be provided are the following: outpatient department (including stomatology), home medical service, medical associates and staff offices, industrial health services, industrial rehabilitation, student and employee health service, and associated administrative and ancillary services. The whole corresponds to a projected rate of outpatient visits of 150,000 to 200,000 per year.

We have accepted this assessment of need, checking it against a more detailed analysis, and have concentrated on the problem of how best to secure the desired adjacencies in an ultimate plan, particularly for key patient services such as X-ray, laboratories, operating suites, etc. and on the equally important problem of handling the large volume of public traffic generated by the ambulatory services.

CLINICAL--BEDPATIENT

Heart of the Massachusetts Memorial Hospitals is the general hospital operated in the three units: Robinson, Collamore, and Evans. These wings were built in that order, end to end;

each new wing matching the previous one in its floor levels. Each building has elevators and stairs of its own, so that circulation is quite diffused. Evans, the largest and most recent, is in itself an institution within MMH, a privately endowed clinical research laboratory conducting research in several branches of clinical medicine. Evans also contains all of the food services and the operating rooms and 60 beds for patients. Administrative elements and laboratory facilities are scattered. Radiology and patient records are in Robinson and need to be relocated near the future ambulatory facilities.

Considering its lack of order, this complex appears to function rather well, but the grouping of staff, patients, research, and services by departments is not possible. As time goes on, the obsolescence of Robinson, the oldest building, will become more of a handicap, and ultimately its replacement with new space will become a necessity.

There is also a general conviction among administration and staff that the hospital is too small. The grouping of hospitals under MMH at one time had 512 beds, but the total number now available in these three buildings is only about 250. There are two reasons for considering this number inadequate. First, larger numbers are needed in order to secure a heterogeneous and representative balance of specialties in the nursing units. For example, obstetrical service has become too small and pediatric service is nonexistent except for research. These different branches are all needed to support each other. Second, although BUSM has access to numerous other large pools of patients, no other hospital is exclusively controlled by its association with the Medical School. In particular, as noted in Chapter II, the future of Boston City Hospital is in some doubt. The School needs a larger teaching hospital to fit its projected larger student enrollment and to afford protection against the uncertainty inherent in its other affiliations.

It is believed that an optimum capacity would be about 500 beds. It would be desirable to have a plan that would permit reaching this goal in stages, at some time also permitting the abandonment of Robinson. Collamore and Evans are in good condition, and if not kept in use for bed care, could be converted to other use. The plan should also, however, complete itself as a much better-organized hospital than the present group, and this latter requirement may find itself in conflict with expedient decisions that will have to be made as opportunities for growth appear. The plan adopted shows a first-stage capacity of 350.

Space requirements for bed-patient care for 350 patients have been determined by a process of extrapolating present MMH space uses and comparing these with standards established by studies of the U. S. Public Health Service for general hospitals.

RESEARCH

Although research has long been an important activity at BUSM-MMH, not until 1960 did the Medical Center obtain an important new facility dedicated entirely to research. About 50,000 sq. ft. of net research space are provided in the new Research Building. It is difficult to evaluate the quantitative adequacy of this building since adjustments of occupancy are taking place according to the differing ability of each department in putting to intensive use the space allocations made.

A new building such as this does not render useless outlying research spaces that may require more isolation nor does it attract to itself clinical research that needs to be very close to bed-patients. Indeed, segregation of research activity in a location all its own sometimes appears to be an artificial solution prompted by the financing conditions of new structures or by the need for separate accounting in a form answerable to sponsoring agencies.

Although it is impossible to make accurate forecasts, it appears certain that it will be necessary in the future to provide considerable additional space exclusively for research. For best convenience and flexibility, space for research should cluster in the vicinity of the new Research Building so that this part of the site would become the research nucleus of the Medical Center.

Extensive conferences with department heads brings out a number of general observations that should guide the policy for providing additional research space. All agree in emphasizing the tight interdependence of research, teaching, and patient care, manifesting itself in the importance of good research facilities in attracting new staff of high caliber, who will initiate important research with its attendant financial support and its intellectual stimulus for education and treatment.

Research is characteristically conducted by teams of various sizes. Typically a full time senior physician or scientist organizes a few younger assistants about a project which proceeds in a suitable work space with appropriate services, tools, equipment and offices. Space for such a team project might be expected to average 1,000 sq. ft. in size. Projection of the desirable future total of senior career staff, with some estimate of the fraction of these who will be active in research gives a basis for the order of magnitude of total research. It would appear that the doubling of present space is foreseeable.

In the preclinical sciences an average of about ten instructors per department is foreseen for an enrollment of 120 students per class. If all these are also senior research investigators, they would need in each science perhaps 10,000 sq. ft. of net research space. Each floor of the present research building affords somewhat less than this and the entire building would no more than match the preclinical research needs. Plans for the structure allow for three additional floors of upward growth, and this increment would be the logical next step in expanding research facilities.

The new teaching laboratory building already described, will furnish in combination with the interconnected research building, the possibility of having research and teaching facilities for each departmental science on the same floor. This would be a great convenience for professors, some of whom would probably prefer to have their offices in the research area while others less involved in research would have to have office space provided in the teaching building.

As the present research building and its new top floors become more oriented toward preclinical research, it will be desirable to provide additional clinical research facilities somewhere else. Financing for this space might come from the Evans endowment. It would seem best for the clinical research space to be generally between preclinical research and patient care. In this way there would be facilitated an intellectual exchange and joint projects between clinical and scientific disciplines, and a close relation could be maintained between clinical research and bed-patient facilities, not only for the convenience of the staff but also to make it easier to bring the bed-patient temporarily to the research project where this procedure will facilitate the work.

The research nucleus resulting from the policy outlined would ultimately result in a group of buildings at the northwest corner of the site. Minor buildings for highly specialized research facilities, such as the radiation research unit that has been discussed among the staff may also find their place in this area.

CIRCULATION AND PARKING

It has already been pointed out that both personnel and clientele of the Medical Center are, in the main, living remote from its facilities; this is likely to remain so no matter how good a residential community can be developed, and hence it is necessary to examine the space requirements for car movement and storage, as this will be an important factor in land acquisition and planning.

In this connection it is again helpful to refer to the questionnaire survey conducted by the BU Planning Office. Among the 2042 respondents from the total community, 1093 now drive their own cars to the site, and the arrival and departure times are such as to generate a peak need for 897 cars between 9 and 11 a.m. Ignoring BCH, the respondents (937) from BUSM-MMH alone indicate a peak need of 466 cars. It is impossible to know whether the non-respondents (1034) would present the same ratio, but if they do the present need is for almost a thousand parking spaces for personnel of the BUSM-MMH Medical Center (and more than double this if Boston City Hospital is included). Counting on an enlarged school (50%), more outpatients, and more bedpatients (100%), the future personnel then will number over 2500. (See Residential) However, it is proposed that 945 of these personnel will be resident in the area; this leaves a remainder of 1585 commuters. If 50% of these drive their own cars, the parking need is for about 800 cars.

How much parking will be needed for patients and visitors? Here there are no surveys to help us and no one interviewed in this study has information about the proportion of patients and visitors who will require parking. A rough guess might say that 500 bedpatients may generate a peak need of 150 parking spaces at visiting hours, and that an ambulatory services program involving 200,000 outpatient visits per year may require 200 parking spaces. It has been emphasized repeatedly that no program to introduce large numbers of private ambulatory patients will succeed unless access and parking are convenient and ample. Among other things this means space for taxis to wait.

A complication arises from the apparent failure of the State Department of Mental Health to include space for parking as part of its criteria for site selection. Certainly the proposed Mental Health Center will prove to be a large traffic generator, since so many of the patients will be moving in and out of the center daily, and there will be a large treatment and research staff. It appears unreasonable to include Mental Health as part of an overall master plan without allowing for its share of the parking load, and impractical to police parking facilities so as to exclude Mental Health clientele and staff. For the time being we have estimated their minimal requirements as 200 cars for clientele, 100 for personnel.

The existing local streets could, in an overall plan adopted with the cooperation of the Boston Redevelopment Authority, be suppressed for public use, but a substantially equivalent area for vehicular circulation will have to be provided, though no doubt differently located.

The ultimate space needs for parking and circulation may be summarized as follows:

1) Personnel parking 900 cars.
Since this is mainly long-term parking, ramp structures providing 4 layers may be assumed.
The ground area needed is:
900 x 350 ÷ 4 = 78,750 sq. ft.

2) Patients and visitors parking 550 cars.
Since this is primarily short-term, by drivers unfamiliar with the arrangements, many of whom are unwell, surface parking should be provided close to public entrances.
The ground area needed is:
550 x 350 + 192,500 sq. ft.

3) Circulation space: approximately 2 acres is estimated 80,000 sq. ft.

Total ground area need (8 acres) 351,250 sq. ft.

PRECLINICAL TEACHING AND RESEARCH FACILITIES

PROJECTED SPACE NEEDS

Department	Academic Facilities & Services	Teaching Laboratories	Offices & Research Laboratories	Total
Medical School				
Administration	5,400			5,400
Library	27,000			27,000
General Teaching	16,600	6,750		23,350
Personnel Services	7,500			7,500
Plant Services	8,700			8,700
Nursing School				
Administration		3,850		3,850
Library		Med. Sch.		
General Teaching		5,200		5,200
Personnel Services		1,950		1,950
Laboratory		2,250		2,250
Anatomy		12,800	12,000	24,800
Biochemistry		7,400	12,000	19,400
Microbiology		7,400	12,000	19,400
Pathology		7,400	12,000	19,400
Pharmacology		7,400	12,000	19,400
Physiology		7,400	12,000	19,400
Animals		7,400		7,400
Net Total n.s.f.	65,200	77,200	72,000	214,400
Circulation & Mechanical	21,500	28,500	38,000	88,000
GROSS TOTAL g.s.f.	86,700	105,700	110,000 including 30,000 new	302,400

PATIENT CARE AND CLINICAL RESEARCH

PROJECTED SPACE NEEDS

Department	Research	Bed Care & Services	Ambulatory	Cent. Diag. & Treatment	Total
Medicine	35,000	15,650	13,000		63,650
Surgery	10,000	21,720	15,000		46,720
Surgical Dept.				10,700	10,700
Obstetrics	2,000	4,350	2,100		8,450
Delivery				3,600	3,600
Gynecology	Incl. with obst.	4,500	incl. with obst.		4,500
Pediatrics	2,000	8,650	2,050		12,700
Preventive Med.	2,000	4,400			6,400
Physical therapy				9,300	9,300
Home med. service				3,200	3,200
Psychiatric	10,000	4,400	4,800		19,200
Stomatology	2,000		9,250		11,250
X-ray, Rad. Ther.			7,100		7,100
Cardiog. & Basal Metab.				1,750	1,750
Necropsy & Histology				4,150	4,150
Service Labs.				2,800	2,800
Pharmacy				1,550	1,550
Teaching space				4,000	4,000
Admin. & Admit.		11,460	5,450		16,910
Central Services		19,400			19,400
Personnel Serv.		4,750			4,750
Dietary Serv.		10,530			10,530
NET TOTAL n.s.f.	63,000	109,810	51,650	48,150	272,610
Circ.,Etc.	37,800	38,430	32,750	24,075	133,055
GROSS TOTAL g.s.f.	100,800	148,240	84,400	72,225	405,665

OTHER FACILITIES

PROJECTED SPACE NEEDS

Department	Total g.s.f.
Power Plant and Maintenance	12,600
Mental Health	280,000
Booth Memorial	25,000
Parking Structure (230 cars)	80,000
Total	397,600

IV. THE ENVIRONMENT

HISTORIC CONTEXT

Since its earliest settlement in the 1630's, Boston has more than doubled its land area through extensive filling and leveling operations. Washington Street follows the line of the original narrow neck of the peninsula to the Roxbury mainland.

The plan of streets on the filled land area was laid out in a grid pattern related to Washington Street. By the 1830's the mainland was accessible by three other parallel streets built on newly filled land: Tremont Street, Shawmut Avenue and Harrison Avenue.

The area developed slowly until the late 1840's. In 1851 Worcester Square and Union Park were laid out and sold at auction. Franklin and Blackstone Squares developed from Columbia Square which was shown on a plan dated 1801.

The Back Bay was developing in a similar way almost simultaneously. The two areas remained separated by the Providence and Worcester Railroad lines and the complex geometry of streets between them.

Due to waves of immigrants the city's population rose from 137,000 in 1850 to 342,000 by 1875. The busy downtown was conveniently connected to the South End via Washington Street by the horse drawn cars of the Metropolitan Railroad.

The preponderance of certain ethnic groups built up strong centers of Roman Catholicism, especially in the North and West Ends of Boston, but this factor was also strongly present in the South End as shown by important Catholic institutional developments.

These included the Jesuit Church of the Immaculate Conception on Harrison Avenue, in 1861; Boston College, in 1863; the Cathedral of the Holy Cross by Charles Bulfinch; and the Catholic Cathedral, in 1867.

The area also became the home of new Protestant churches which were founded in the nineteenth century. These included the Unitarian Church of the Unity in 1857; Church of the Disciples in 1869; the South Congregational Church in 1862; the Shawmut Congregational Church in 1849; and Union Church in 1870.

The original buildings of the Boston City Hospital were built between 1861 and 1864. Other institutions followed including: the Girl's High School in 1870 and the Boston Latin and English High Schools in 1877.

The Massachusetts Memorial Hospitals, previously the Massachusetts Homoeopathic Hospital, opened its central building for patients in May, 1876. With further additions in 1883 and 1891 it became, at that time, the third largest general hospital in New England.

A comprehensive picture is drawn in a description by Walter Muir Whitehill. "Although the Neck lands had been laid out into streets since early in the nineteenth century, further development was slow. However, beginning in the fifties the area rapidly grew into a region of symmetrical blocks of high-shouldered, comfortable red brick or brownstone houses, bow-fronted and high stooped, with mansard roofs, raised along spacious avenues, intersected by cross streets that occasionally widened into tree shaded squares and parks, whose central gardens were enclosed by neat cast iron fences. Yet this seemingly attractive South End never fulfilled its promise, for it began to slip into grubbiness while still comparatively new."

OTHER MEDICAL INSTITUTIONS

The BUSM-MMH Medical Center is one of four major medical complexes within the central area of the City limits of Boston. The three medical schools of Massachusetts are housed in these centers. To the west is Harvard Medical School and its affiliates. Between BUSM-MMH and the central business district lies The New England Medical Center with the Tufts Medical School. Further north is the Massachusetts General Hospital. Physicians' offices to care for private patients have developed primarily in the Back Bay along Beacon Street and Bay State Road. Figures 5 and 6 show how these centers are served by existing or planned expressway routes. An important Veterans Administration Hospital serving all three medical schools is somewhat further out in Roxbury.

ACCESSIBILITY

Through its early life BUSM-MMH like other urban medical institutions was oriented toward the population of its district. The physical equipment of this quarter of Boston is now a century old and will soon be subject to the powers of urban renewal, no doubt accompanied by substantial social changes. The Center's increasing role in education and research, meanwhile, tend to establish an ever wider clientele. The far more mobile population of today, to speak only of greater Boston, are spread over several hundred suburban square miles where increasingly the private automobile is the only useful vehicle for personal locomotion.

The South End no longer provides, if it ever did, residential facilities attractive to a majority of staff and students at the Center, and most live at a considerable distance. Figures 3 and 4 show this distribution for students.

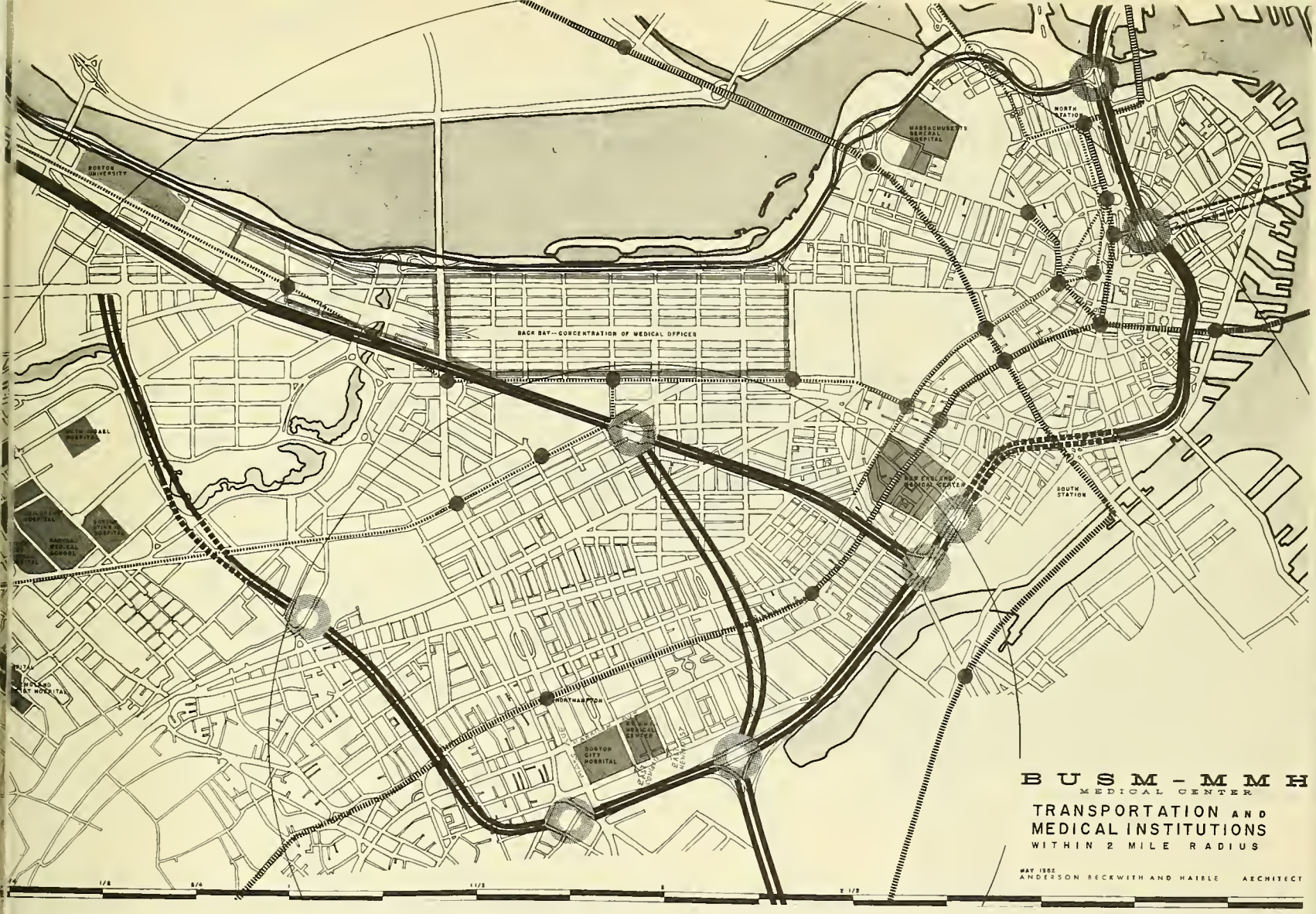

BACK BAY--CONCENTRATION OF MEDICAL OFFICES
BOSTON UNIVERSITY
MASSACHUSETTS
NORTH STATION
SOUTH STATION
BOSTON CITY HOSPITAL
BUSM - MMH
MEDICAL CENTER
TRANSPORTATION AND
MEDICAL INSTITUTIONS
WITHIN 2 MILE RADIUS
MAY 1952
ANDERSON BECKWITH AND HAIBLE ARCHITECT

Figure 5

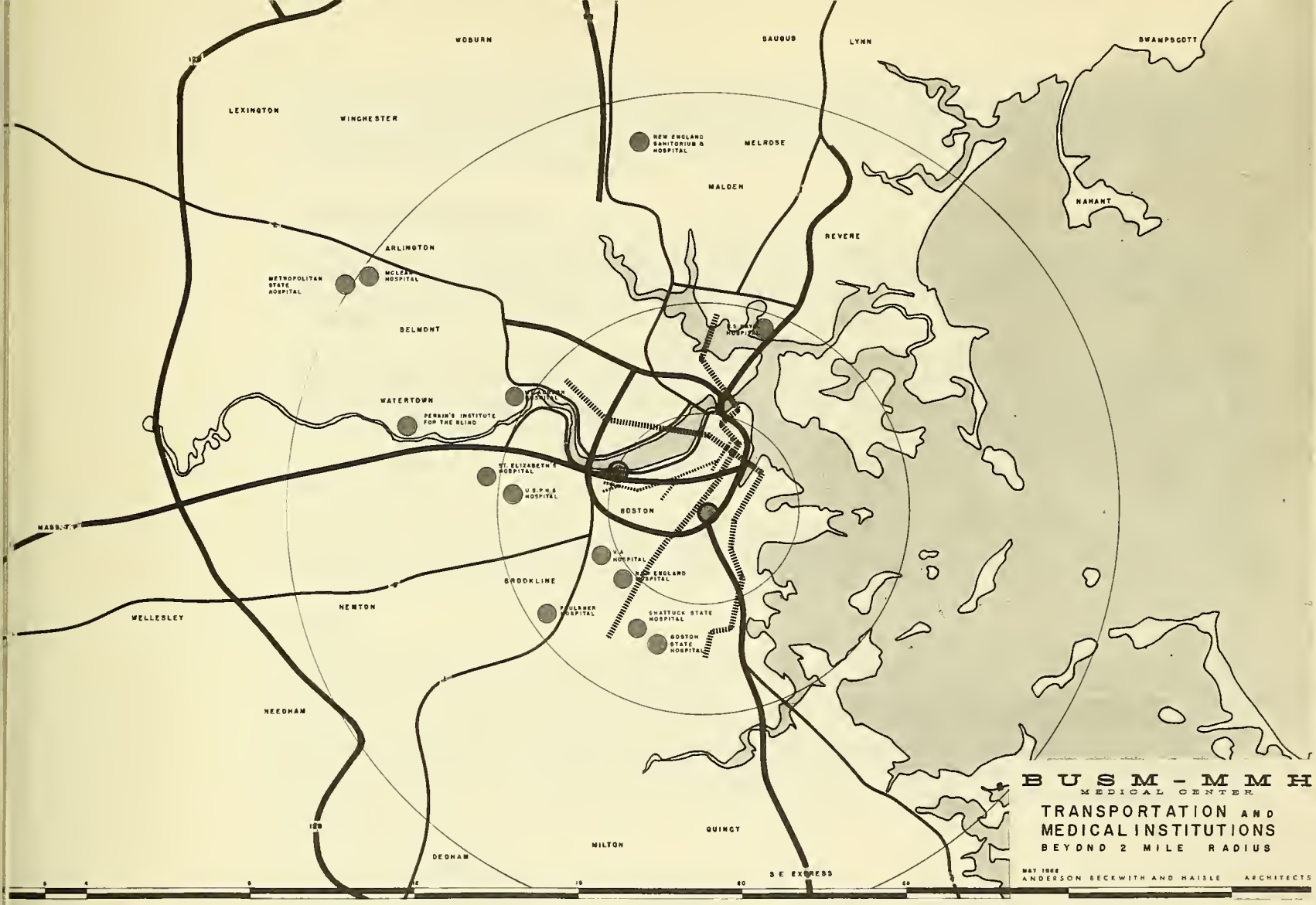

WOBURN
SAUGUS
LYNN
SWAMPSCOTT
LEXINGTON
WINCHESTER
NEW ENGLAND SANITORIUM & HOSPITAL
MELROSE
MALDEN
NAHANT
REVERE
ARLINGTON
METROPOLITAN STATE HOSPITAL
MCLEAN HOSPITAL
BELMONT
WATERTOWN
PERKIN'S INSTITUTE FOR THE BLIND
ST. ELIZABETH'S HOSPITAL
U.S.P.H.S. HOSPITAL
BOSTON
MASS. T. P.
V.A. HOSPITAL
NEW ENGLAND HOSPITAL
BROOKLINE
FAULKNER HOSPITAL
NEWTON
WELLESLEY
SHATTUCK STATE HOSPITAL
BOSTON STATE HOSPITAL
NEEDHAM
QUINCY
MILTON
DEDHAM
S.E. EXPRESS
BUSM - MMH
MEDICAL CENTER
TRANSPORTATION AND MEDICAL INSTITUTIONS
BEYOND 2 MILE RADIUS
MAY 1966
ANDERSON BECKWITH AND HAISLE ARCHITECTS

Figure 6

For these reasons the Center must in its expansion plans take into account its orientation toward major vehicular routes and its problems of parking for the private vehicles of staff and patients. These introduce an entirely new dimension and will ultimately produce an institution very different from the old pattern of buildings packed to the very edges of sites on narrow crowded streets.

Automobile Transportation

For many years central Boston has been accessible primarily via its east-west spine. The Central Business District has been growing outward toward the proposed Prudential Center, and the main line centering on Huntington Avenue has tended to leave the old South End as a peripheral eddy not traversed by the principal routes.

The Fitzgerald and Southeast Expressways and the projected Inner Belt route have shown the first outlines of an entirely new system, circumferential in pattern. The Medical Center has not yet experienced the impact of the completed system but a glance at the map will show how the construction of the Ruggles Street portion of the Inner Belt will not only furnish a direct connection with the campus of Boston University but will also pick up the major radial routes of Greater Boston and bring their traffic to the Center with a minimum of strain on local streets.

In addition to the interchange at Massachusetts Avenue, there is tentatively contemplated a set of feeders (see figure 5) extending inward toward Copley Square from the Southeast expressway, thus adding another approach to the Center.

Parking

Inadequate parking facilities constitute a major problem at present. There is no off-street provision for cars of patients and visitors. Staff parking is limited to small parking lots adjacent to the new research building, the Talbot Building, Evans, and the Armory. Recently acquired and cleared lots between East Newton Street and Sharon Street are also being used for staff parking. The Monastery located to the north of the Medical Center makes some parking space available on a rental basis. No parking facilities are provided for students. The current practice of students is to park on neighboring streets and risk tagging by the police.

Public Transportation

It must be assumed that public transportation will remain an important consideration for a substantial number of patients, students, and staff.

Both medical and nursing students (and some of the faculty) will have commuting problems between the Center and the river campus of Boston University. When new housing is provided for students at the Center, their accessibility to the river campus and to shopping and recreation facilities via public transportation will affect the viability of housing provisions.

Although no conclusive figures are available to indicate the proportion of patients and visitors who come to the hospitals by public transportation, any increase in outpatient activity, and especially a large increment like the Mental Health Center, will cause additional traffic on transit lines.

Existing public transportation routes serving the Center are shown on Figure 5. The major route, The Everett-Forest Hills line for subway and elevated trains, has for a long time provided quick access to downtown Boston. Quite possibly the elimination of this elevated structure may be one of the objectives of redevelopment because of the bad influence it has had on local uses along Washington Street, but it is to be hoped that it can be relocated or put underground so as not to deprive the Center of convenient rapid transit.

With the expected increase in retail activities in the vicinity of Copley Square as part of an extended Central Business District there would be need for improved crosstown connection to cover the mile separating Copley Square from the Center. Although Route 68 of the MTA purports to make the connection now, the service is not constant. Lack of continuity in the street pattern in this part of the city has no doubt interfered with ease of connection. Possibly this can be improved through redevelopment. Massachusetts Avenue does offer a direct-line crosstown route but it does not connect with Copley Square or Boston University and consequently is less useful to the Medical Center. In addition, Massachusetts Avenue is so encumbered that movement on it is generally slow.

Local Streets

Among local streets Harrison Avenue is by long usage the accepted feeder street for vehicles serving both MMH and Boston City Hospital. Newton Street, at right angles, is unique in running directly from the Center to the Prudential site. Albany Street has been a heavy trucking street for nearby industrial service. It is now in the process of becoming a feeder to the expressway system rather than a main truck route.

Study of the local street pattern and consultation with staff of the Boston Redevelopment Authority suggests the following assumptions:

a. Harrison Avenue should remain as one of a series of streets leading to and from Central Boston.

b. East Concord Street should remain as serving the Boston City Hospital and elements of the Medical Center.

c. Albany Street should be relocated and absorbed as part of the expressway and its feeder system. At present there appears to be a substantial amount of westbound traffic, preponderantly trucking. Owing to the routing of traffic around the Southampton Street - Massachusetts Avenue intersection, eastbound traffic has access to the expressway before coming to Albany Street and this has diverted vehicles off Albany Street. A similar local westbound street next to the expressway would take care of the westbound component as part of the expressway complex.

LOCAL LAND USES

Although one thinks of the South End as a dense residential district, the immediate environment of the Medical Center has a very mixed use. Worcester Square and its surroundings, though greatly deteriorated, and though blighted near Washington Street and Massachusetts Avenue, seems definitely amenable to retention of the old town houses and their rehabilitation as apartments and rooming houses. The Square still preserves the tremendous amenity of its park and trees. On the other hand the houses on Sharon, Brookline, and Canton Streets between Harrison and Albany Streets seem equally clearly slated for removal. Their deterioration is further advanced, they lack landscape amenity and they have been invaded by industry which encroaches along an irregular front in the vicinity of Canton Street. In view of the impingement of fixed installations preventing expansion of the Medical Center to west and north, this area of deteriorated housing also appears to offer the most promising direction of long-term growth for the Center.

Institutional

Expansion is blocked to the west by the Boston City Hospital. This institution also has facilities across Massachusetts Avenue to the west and across Albany Street to the south.

In the very heart of the area occupied by BUSM-MMH and partly surrounded by it is a Commonwealth of Massachusetts National Guard Armory. It is the policy of the National Guard to replace these old intown facilities with new installations in the suburbs more accessible

to the members and with more space for vehicular equipment. Commonwealth agencies are proposing that after removal of the National Guard the General Court make this site available for the Mental Health Center. That this particular location would not be consistent with the development of the best plan for the Medical Center as a whole, will be made apparent in Chapter V.

North of Harrison Avenue expansion possibilities for the Center are limited by the apparent immovability of most of the present land uses. Between Concord and Newton Streets lies the Church of the Immaculate Conception and the attached Jesuit House. Extending from Brookline Street to Monsignor Reynolds Way is a public housing project first occupied in 1951. This facility is administered by the Boston Housing Authority. Between Newton and Brookline Streets and straddling Washington Street is a valuable green space: Blackstone and Franklin Squares. A small block of buildings separates this park land from Harrison Avenue and prevents the Center from having a window on the park. The block consists of vacant land where tax-delinquent houses have been removed, some small apartment structures, a Syrian church and school, and the Joshua Bates Public School. The latter was built in 1884 and would probably disappear in any drive to improve the physical facilities of the Boston Public Schools.

Municipal - Industrial

South of Albany Street there is a strip of land fronting on a narrow channel of dirty water, all that is left of the old South Bay. In the past this was connected to Fort Point Channel and to the harbor. This watercourse still functions as an open industrial sewer through the study area, but its drainage and filling are responsibilities shared by state and municipal Government and scheduled for execution in the near future. Present uses of the land strip are--beginning at Massachusetts Avenue--the Mallory Institute of Pathology, service buildings of the Boston City Hospitals, a building used by the Water Department of the City of Boston, yards and buildings of the Public Works Department of the City of Boston, and private industry (trucking, lumber) beginning about opposite the end of Canton Street.

The Department of Public Works is seeking authorization to move its facilities to new yard space near the new municipal incinerator and other City of Boston facilities on the South Boston side of the expressway. This would make available the most important part of the landstrip just opposite Medical Center facilities, which together with the realignment of Albany Street, would provide another direction for future growth, though it is definitely limited by the expressway itself.

V. PROPOSALS

Any proposals for a master plan to guide future development of the Medical Center must be formulated with two principal sets of criteria in mind. At times it has appeared that these two kinds of values might lead to different conclusions.

Firstly, the plan must lead in the direction of a well-functioning complex, in which each part is linked to its most closely related neighbors, and in which every branch of the Center is afforded a chance to develop without undue restrictions. Such a plan must also provide orderly access to its several elements by students, staff, patients, and visitors, including provision for parking of private vehicles. There must be the possibility of establishing an efficient system of pedestrian circulation connecting all of the units, under cover and at several levels where possible.

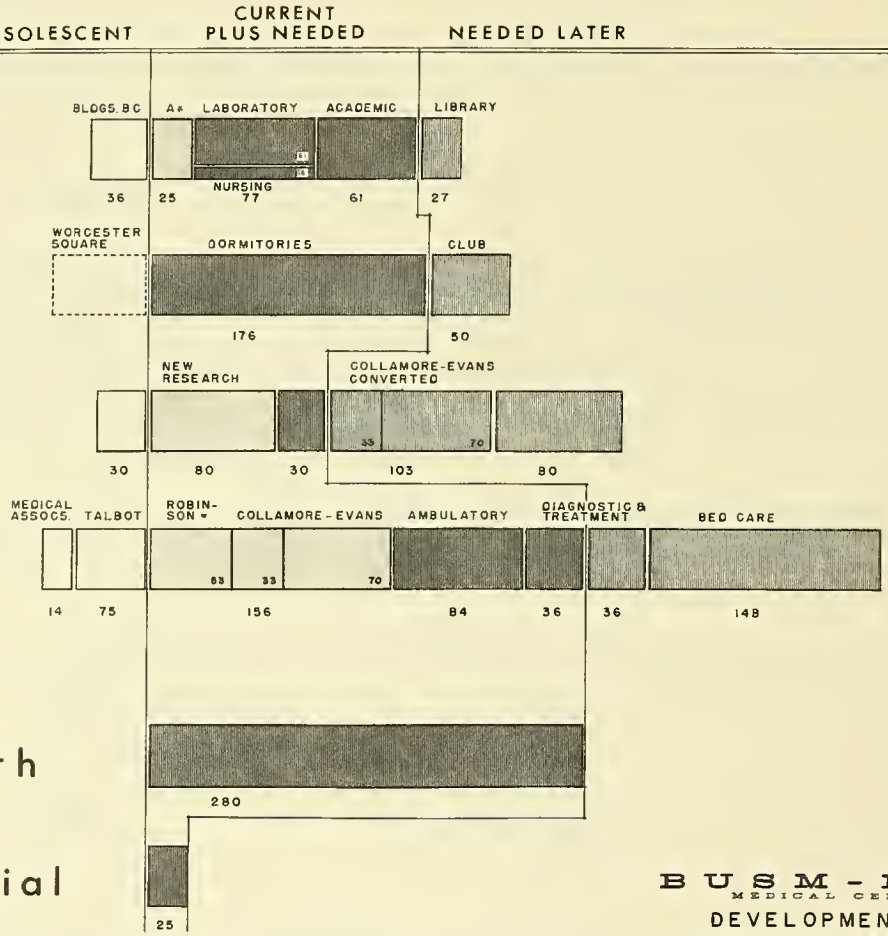
Secondly, the plan must be realizable. It must visualize a reasonable process of growth by stages. Growth involving replacement of obsolete facilities must be so placed as to permit keeping the old until the new is available, since every department must function without interruption.

The plan must also contain benefits for all institutions and agencies concerned, so that it will seem worthwhile to cooperate to achieve a result so generally beneficial. In particular, the Commonwealth's Department of Mental Health should feel that the place in the plan for the Mental Health facility is advantageous and appropriate, and the Boston Redevelopment Authority should agree with the plan's direction in respect to the needs of the South End generally.

Figure 7 provides in graphic form a summary of floor areas in different categories, tabulated in more detail in Appendix I. Here it is possible to compare the areas proposed for the several categories of use, and to evaluate them in relation to existing areas, some of which would be scheduled for early demolition and others retained for an indeterminate period of future use.

In round figures BUSM-MMH now has over 400,000 sq. ft. of building, or 10 acres. The foreseeable needs of the Medical Center including the two new medical agencies that are to be associated will increase the occupied total to roughly 1,000,000 sq. ft. or 25 acres. Still later the strictly institutional uses might easily reach 32 acres, and if the total housing needs of the medical community are ultimately to be satisfied, the constructed gross total of floor space could surpass 50 acres.

WNER · PROGRAM · ·FACILITY·



SM

SM
MH

MH

nmonwealth
Massachusetts

vation
ny

BUSM - MMH
MEDICAL CENTER
DEVELOPMENT OF MEDICAL CENTER
GROSS AREA IN THOUSANDS OF SQUARE FEET
*TO BE REMOVED AT LATTER STAGE
MAY 1966
ANDERSON BECKWITH AND HAIBLE ARCHITECTS

Figure 7

How much land will be needed to accommodate these building areas comfortably? There are several yardsticks.

The present experience of the Medical Center is one. Its existing 10 acres of floor area are sited on 7 or 8 acres of land, including the areas east of East Newton Street which are used for parking. This is a ratio of about 1.3.

The housing in Worcester Square also has a floor area ratio of about 1.3. The density of Boston City Hospital probably is closer to 2.0.

For institutional use why should one not propose substantially higher densities than these? Indeed hospitals many stories high are often very efficient. It is the problems of access and parking that are intensified as the density increases. So long as we must envisage a situation where personal transportation will be the dominant mode of access we must provide the channels of movement and the areas of storage this mode requires.

Rough approximations of future parking and circulation needs suggest that some 8 acres will be needed for drives and parking (See Chapter III).

What about the other land uses? Hospital and laboratory buildings already built or needed in the Medical Center appear to work well at heights of from 6-12 floors, but not all buildings should be this high. Perhaps an average of 4-7 floors would be the expected range.

Ground area requirements for 32 acres of floor area might then be about as follows:

drives and parking	8 acres
building coverage	5 -- 8 acres
green	5 -- 10 acres
total	18 -- 26 acres

In the foregoing it is assumed that some of the parking would be on the ground level. Economically speaking, under today's conditions in this area it probably should all be on the ground, since it will cost less to acquire more land and clear it than to build

parking ramp structures. However, the difference in cost may not always remain appreciable, and there are advantages to parking ramps, such as better control, shorter walking distances, better protection, and more compact overall plan, that might outweigh the economic consideration. Perhaps the best approach to this question is to continue to use the ground for parking as long as land acquisition keeps sufficiently ahead of building construction, but to be prepared for multiple-layer garaging as soon as the plan gets so big or the land so valuable as to require it.

Considering the overall economics of density for the Medical Center, the design, construction and equipment of buildings for institutional uses like these will no doubt cost on the average at least $30/sq. ft., whereas the cost of acquiring and clearing land in this part of the South End may be about $2.50/sq. ft. (see figure 8). Thus at a floor area ratio of say 1.5 the cost of the land will be about 5 per cent of total cost, which seems reasonably low.

The area bounded by East Concord Street, Harrison Avenue, East Brookline Street, and Albany Street, plus the area across Albany Street immediately opposite, is about 22 acres. This parcel is approximately square in shape, which leads to compactness in planning, and is presently traversed by only one important street, Albany Street. It is therefore proposed that it be considered as the site to be assembled for long-term use by the Medical Center. (Alternately a site of roughly the same area though less square, could be assembled by including, instead of the land south of Albany Street, that in the blocks East Brookline -- Harrison Avenue -- East Dedham Street -- Albany Street).

Adjoining the proposed institutional parcel on the east would be another approximately square area of about 25 acres, containing, it would seem, nothing except clearable structures, and bounded eventually on the west by the Medical Center, the north by the "Cathedral" Housing Project, the east by the Cathedral and the proposed feeder ramps of the Southeast Expressway, and the south by the Inner Belt Expressway itself. This parcel is put forward in our proposals as an area for private redevelopment, although the Medical Center institutions would do well to consider participating in the planning and sponsorship of such redevelopment, not only to influence its character but if feasible also to retain some eventual title as an insurance of future land supply if unforeseeable needs require a larger property.

The Medical Center is also very much at interest in the disposition of the parcel between East Newton and East Brookline Streets just north of Harrison Avenue, about 1.9 acres in extent. Reason for this concern is the possibility of obtaining a frontage on the park to the north.

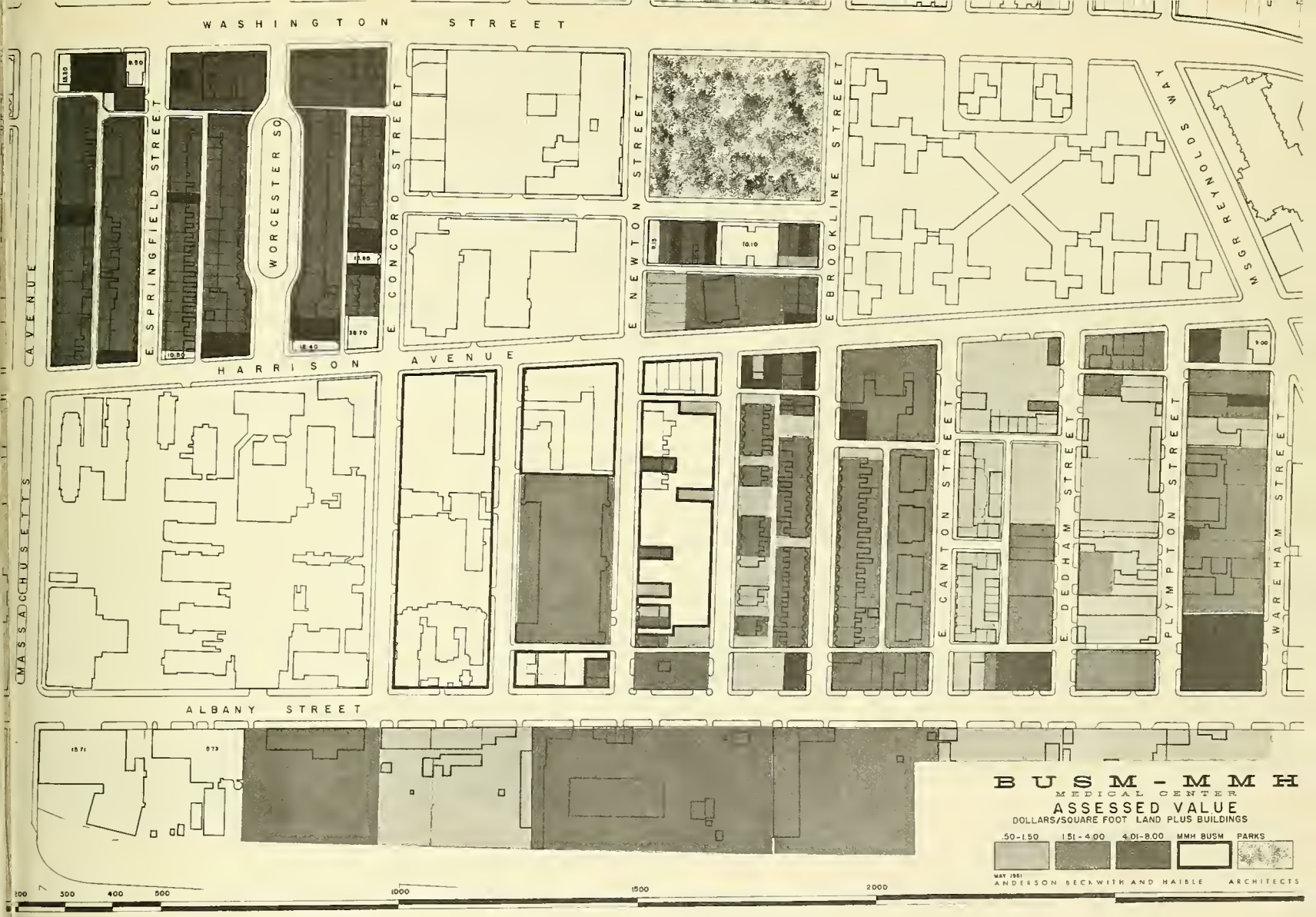

WASHINGTON STREET
E SPRINGFIELD STREET
WORCESTER SQ
E CONCORD STREET
E NEWTON STREET
E BROOKLINE STREET
REYNOLDS WAY
AVENUE
HARRISON AVENUE
MASSACHUSETTS
E CANTON STREET
E DEDHAM STREET
PLYMPTON STREET
WAREHAM STREET
ALBANY STREET
BUSM - MMH
MEDICAL CENTER
ASSESSED VALUE
DOLLARS/SQUARE FOOT LAND PLUS BUILDINGS
.50-1.50
1.51-4.00
4.01-8.00
MMH BUSM
PARKS
MAY 1981
ANDERSON BECKWITH AND HAIBLE ARCHITECTS
200
300
400
500
1000
1500
2000

Figure 8

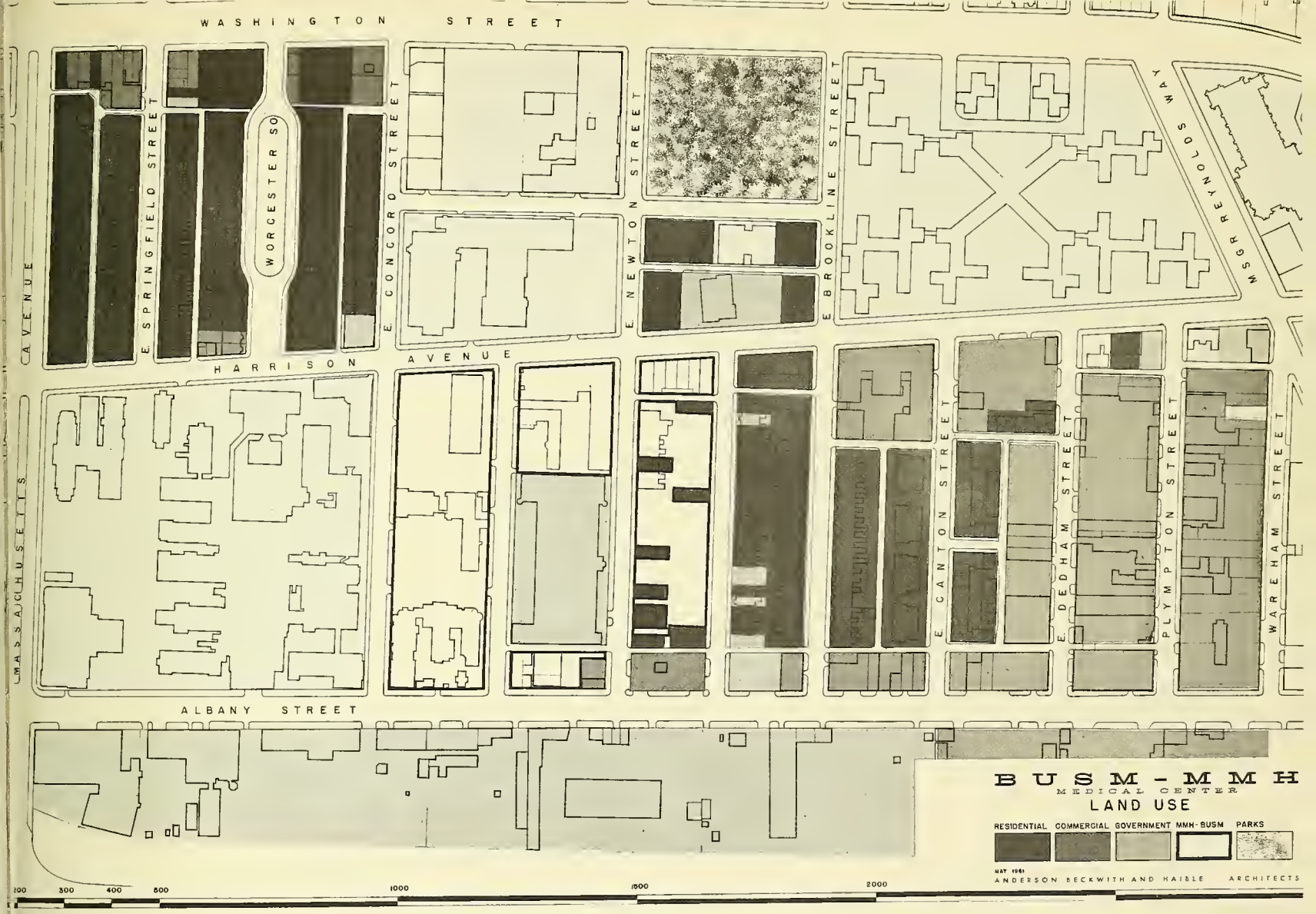

WASHINGTON STREET
E SPRINGFIELD STREET
WORCESTER SQ
E CONCORD STREET
E NEWTON STREET
E BROOKLINE STREET
MASSACHUSETTS AVENUE
HARRISON AVENUE
E CANTON STREET
E DEDHAM STREET
PLYMPTON STREET
WAREHAM STREET
ALBANY STREET
BUSM - MMH
MEDICAL CENTER
LAND USE
RESIDENTIAL
COMMERCIAL
GOVERNMENT
MMH-BUSM
PARKS
MAY 1961
ANDERSON BECKWITH AND HAIBLE ARCHITECTS
200
300
400
500
1000
1500
2000

Figure 9

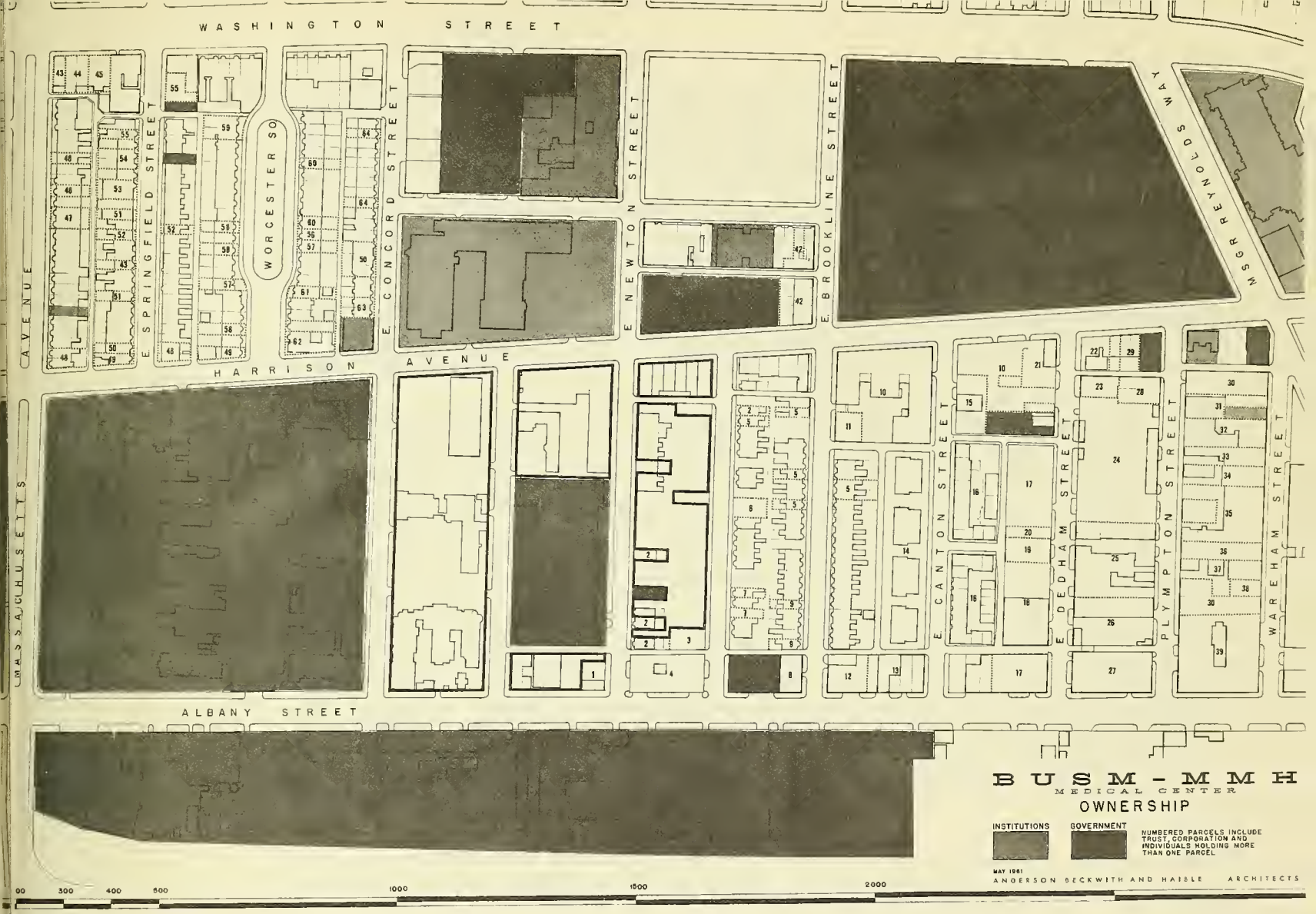

WASHINGTON STREET
E SPRINGFIELD STREET
WORCESTER SQ
E CONCORD STREET
E NEWTON STREET
E BROOKLINE STREET
MAGRAW REYNOLDS
HARRISON AVENUE
MASSACHUSETTS AVENUE
E CANTON STREET
E DEDHAM STREET
PLYMPTON STREET
WAREHAM STREET
ALBANY STREET
BUSM - MMH
MEDICAL CENTER
OWNERSHIP
INSTITUTIONS
GOVERNMENT
NUMBERED PARCELS INCLUDE TRUST, CORPORATION AND INDIVIDUALS HOLDING MORE THAN ONE PARCEL
MAY 1981
ANDERSON BECKWITH AND HAIBLE ARCHITECTS
00 300 400 500 1000 1500 2000

Figure 10

One additional area should be mentioned here, the approximately 10-acre parcel including Worcester Square, already discussed in Chapter III under the heading, Residential. If it should become appropriate to encourage a housing community to provide for all medical personnel including those of Boston City Hospital, such a community could be accommodated on this site or as part of the private redevelopment east of the Medical Center.

This report will recommend one specific master plan for the long-term development of the Medical Center parcel of 22 acres, but the diagrams of two other possible plans will be discussed in order to make the final choice of plan clearer.

There is urgent need to find sites for, to finance, and to build three projects: the teaching laboratories, the ambulatory services, and the residential units. In the case of the first of these the choice of site is obvious and the land is available; the siting of the other two will determine the direction the master plan must take.

In Plan 1 (see figure 11) is shown what would result if these two projects are sited on land now available just east of East Newton Street. These are the only sites that could be used almost immediately. Once this decision was made the Commonwealth of Massachusetts would have little choice except to carry out its present plan of putting the Mental Health facility on the Armory Site. Mental Health would be in the center of the entire development, but on a site that touches no major street and that is too small to provide its own parking. Though quantitative estimates have not been furnished, it is clear from the contemplated size of Mental Health, and from its busy clinical program, that it will be a heavy traffic generator. The student dormitory would find itself located across a narrow street from the busy entrance to Mental Health with its attendant congestion of vehicles. The Ambulatory Services unit would be built in what appears in the short term a satisfactory location, with adequate vehicular approaches for patients coming via Harrison Avenue. The building could probably be connected to Evans by a bridge at some upper floor across East Newton Street, thus assuring enclosed circulation to connect all MMH patient care facilities. However, the hospital would now find itself hemmed in, with no further growth possibilities on the present site. When new facilities for bed care are needed, they must be added still further east, and at that time Robinson, Collamore, and Evans can be devoted wholly to research. This is a possible plan but the arrangement of teaching, research, ambulatory, diagnostic, and bed-patient units is very linear and lacks the compactness that other plans could provide.

In Plan I it is further assumed that Albany Street will not be relocated and that the land now occupied by the Department of Public Works can be acquired by the Medical Center and used for parking. This parking is rather remote from the principal centers of public use.

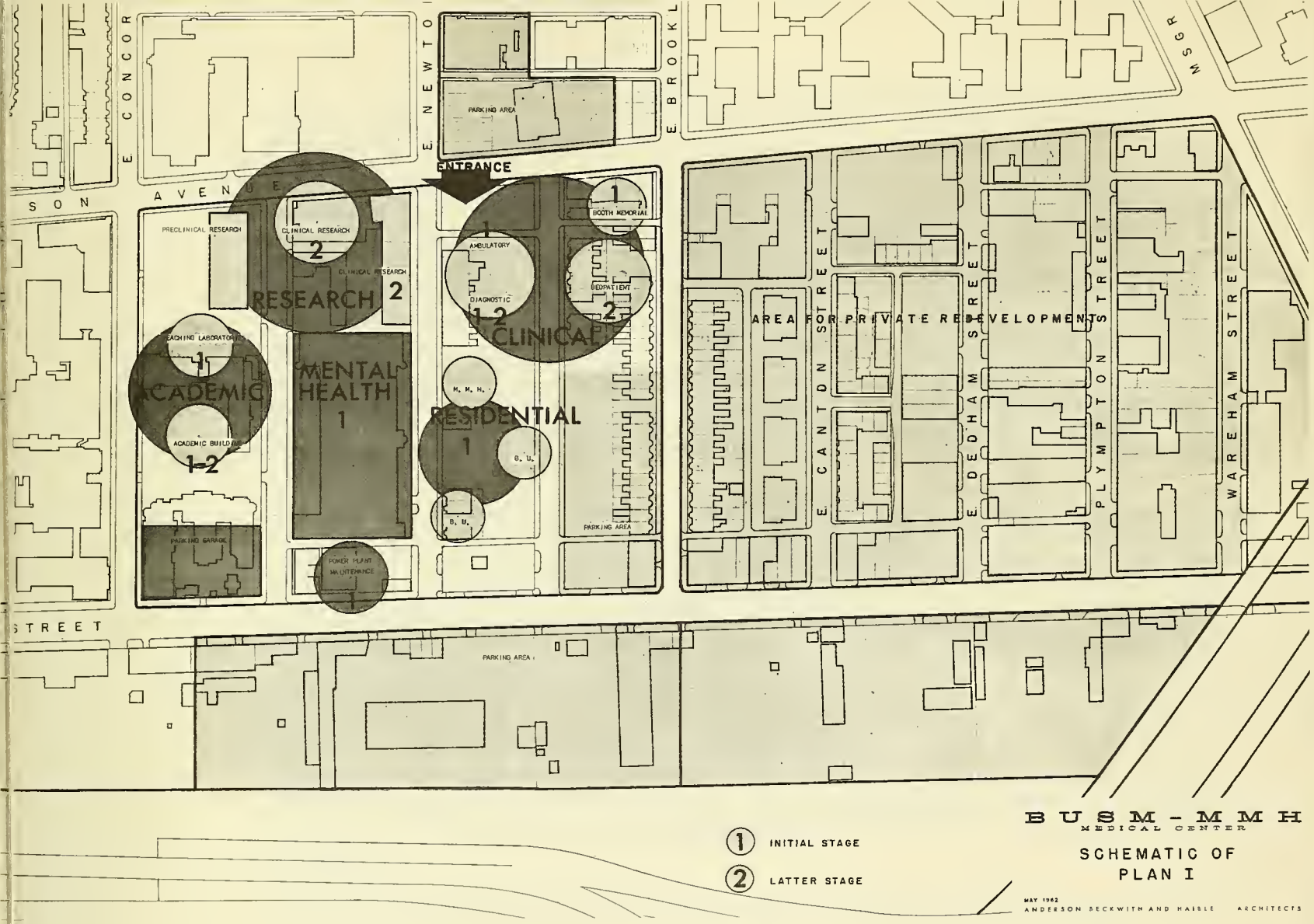

E. CONCORD
E. NEWTON
E. BROOKLINE
MSGR
AVENUE
PARKING AREA
ENTRANCE
PRECLINICAL RESEARCH
CLINICAL RESEARCH
2
CLINICAL RESEARCH
RESEARCH
2
TEACHING LABORATORIES
1
ACADEMIC
ACADEMIC BUILDING
1-2
MENTAL HEALTH
1
POWER PLANT MAINTENANCE
1
PARKING GARAGE
1
BOOTH MEMORIAL
1
AMBULATORY
DIAGNOSTIC
1-2
CLINICAL
BEDPATIENT
2
M. M. H.
RESIDENTIAL
1
B. U.
B. U.
PARKING AREA
AREA FOR PRIVATE REDEVELOPMENT
E. CANTON STREET
E. DEDHAM STREET
PLYMPTON STREET
WAREHAM STREET
STREET
PARKING AREA
1 INITIAL STAGE
2 LATTER STAGE
BUSM - MMH
MEDICAL CENTER
SCHEMATIC OF
PLAN I
MAY 1962
ANDERSON BECKWITH AND HAISLE ARCHITECTS

Figure 11

Plan I represents the picture of congestion on Harrison Avenue and a sea of parking on Albany Street. Yet it would be difficult to avoid just this result given the initial assumptions and decisions.

In Plan II (see figure 12) an attempt is made to avoid some of the disadvantages of Plan I. A different site is proposed for the residential unit, the 1.9 acres between Harrison Avenue and Franklin Square. This site is not now owned by the Center, and its acquisition could probably be obtained only through Urban Renewal participation. This would take time, and in the meanwhile BUSM will face a crisis in student housing unless there is a temporary solution through early rehabilitation of houses in Worcester Square. Plan II also suggests the advantages inherent in closing East Newton Street and relocating Albany Street (for the latter see Chapter IV). This would make of the medical campus a superblock having only private driveways. East Brookline Street would serve as a feeder for all patient and visitor traffic. An ample forecourt would furnish approach space for Mental Health and for both inpatient and outpatient activity at MMH. In both these plans a site for the proposed Booth Memorial is provided near the corner of Harrison Avenue and East Brookline Streets, while staff parking and enlarged power and maintenance facilities could be placed near the opposite corner at East Concord and Albany Streets.

Plan III (see figure 13) attempts to overcome the congestion that results from placing the Mental Health Center on the Armory site. If the entire 22-acre area can be pooled and the streets discontinued or relocated, Mental Health should be sited further toward the southeast corner in a location far more visible from the Expressway and more accessible also from East Brookline Street. The Armory site would then be used for Ambulatory Services, and the entire future replacement and expansion of patient care facilities at MMH could develop parallel to the medical school buildings to the west. Ultimately a low building housing central services could connect all the BUSM-MMH buildings. Booth Memorial and Mental Health would also be connected under cover to MMH so as to share as planned in many of the facilities and to be intimately a part of the teaching, research, and treatment program of the Medical Center. The open spaces toward the west of the site could be treated as green space with planting and trees, while the large parking areas would be primarily on the eastern, or public side, off East Brookline Street. In this plan the residential facilities have been located at the northeast corner on land most of which is presently available, but this location for them is not essential to the plan. They could equally well be outside the main institutional parcel on one of the other adjacent parcels discussed.

This last plan (see figure 14 for a more realistic layout) is the one which this study urgently recommends as a plan of action. It is our deep conviction that carrying out

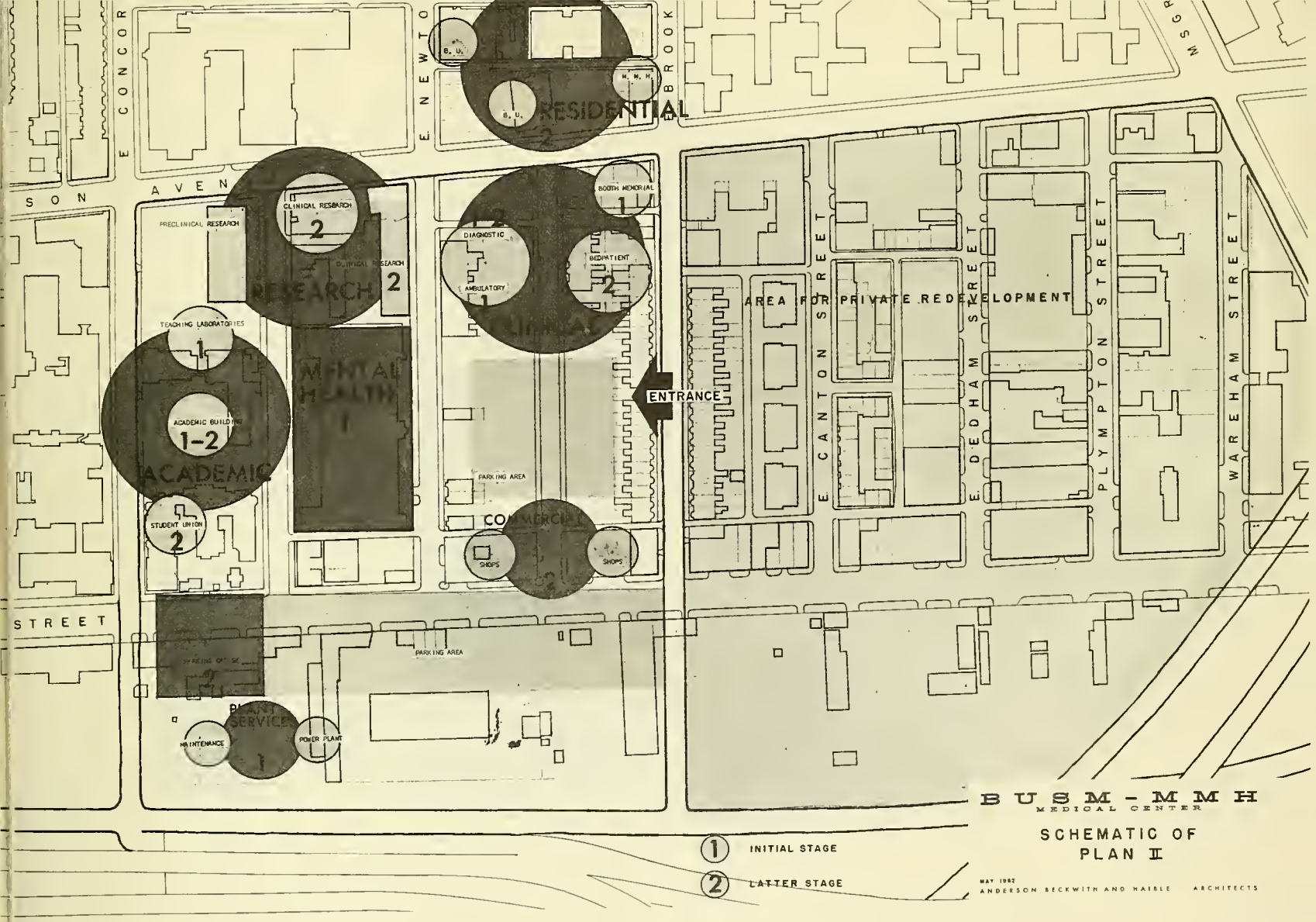

E. NEWTON STREET
E. BROOKLINE
RESIDENTIAL
B. U.
W. M. H.
CLINICAL RESEARCH
2
PRECLINICAL RESEARCH
RESEARCH
2
DIAGNOSTIC
AMBULATORY
1
BOOTH MEMORIAL
1
BED PATIENT
2
TEACHING LABORATORIES
1
MENTAL HEALTH
1
ACADEMIC BUILDING
1-2
ACADEMIC
STUDENT UNION
2
PARKING AREA
SHOPS
2
ENTRANCE
AREA FOR PRIVATE REDEVELOPMENT
E. CANTON STREET
E. DEDHAM STREET
PLYMPTON STREET
WAREHAM STREET
STREET
PARKING AREA
PLANT SERVICE
MAINTENANCE
POWER PLANT
1
BUSM - MMH
MEDICAL CENTER
SCHEMATIC OF
PLAN II
1 INITIAL STAGE
2 LATTER STAGE
MAY 1962
ANDERSON BECKWITH AND HAIBLE ARCHITECTS

Figure 12

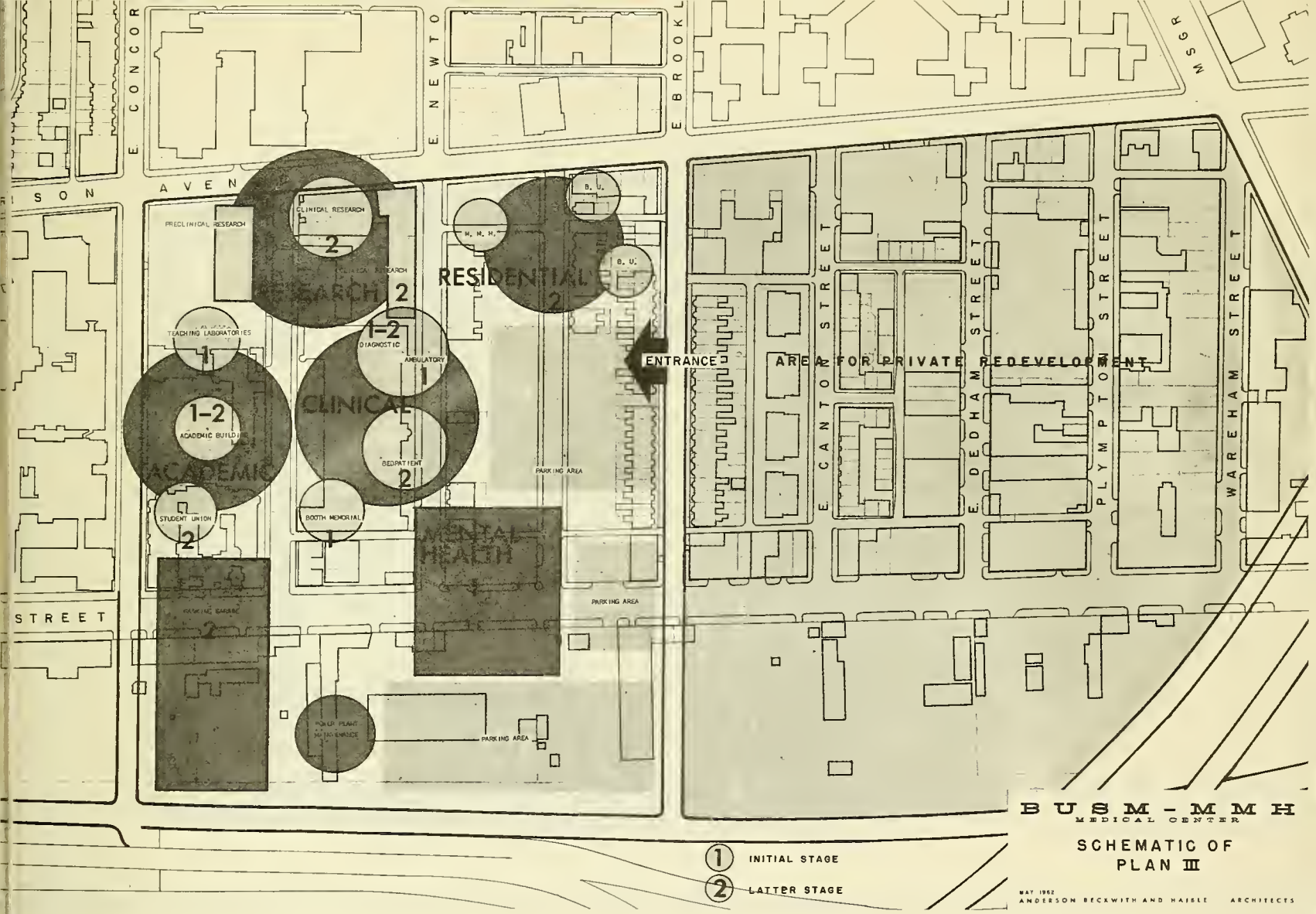

E. CONCOR
E. NEWTO
E. BROOKL
MSGR
AVEN
SON
STREET
PRECLINICAL RESEARCH
CLINICAL RESEARCH
2
RESEARCH
2
RESIDENTIAL
2
B. U.
M. M. H.
TEACHING LABORATORIES
1
1-2
DIAGNOSTIC
AMBULATORY
1
1-2
ACADEMIC BUILDING
ACADEMIC
CLINICAL
DEPARTMENT
2
STUDENT UNION
2
BOOTH MEMORIAL
1
PARKING GARAGE
2
MENTAL HEALTH
PARKING AREA
POWER PLANT
MAINTENANCE
ENTRANCE
AREA FOR PRIVATE REDEVELOPMENT
E. CANTON STREET
E. DEDHAM STREET
PLYMPTON STREET
WAREHAM STREET
BUSM - MMH
MEDICAL CENTER
SCHEMATIC OF
PLAN III
MAY 1962
ANDERSON BECKWITH AND HAIBLE ARCHITECTS
1 INITIAL STAGE
2 LATTER STAGE

Figure 13

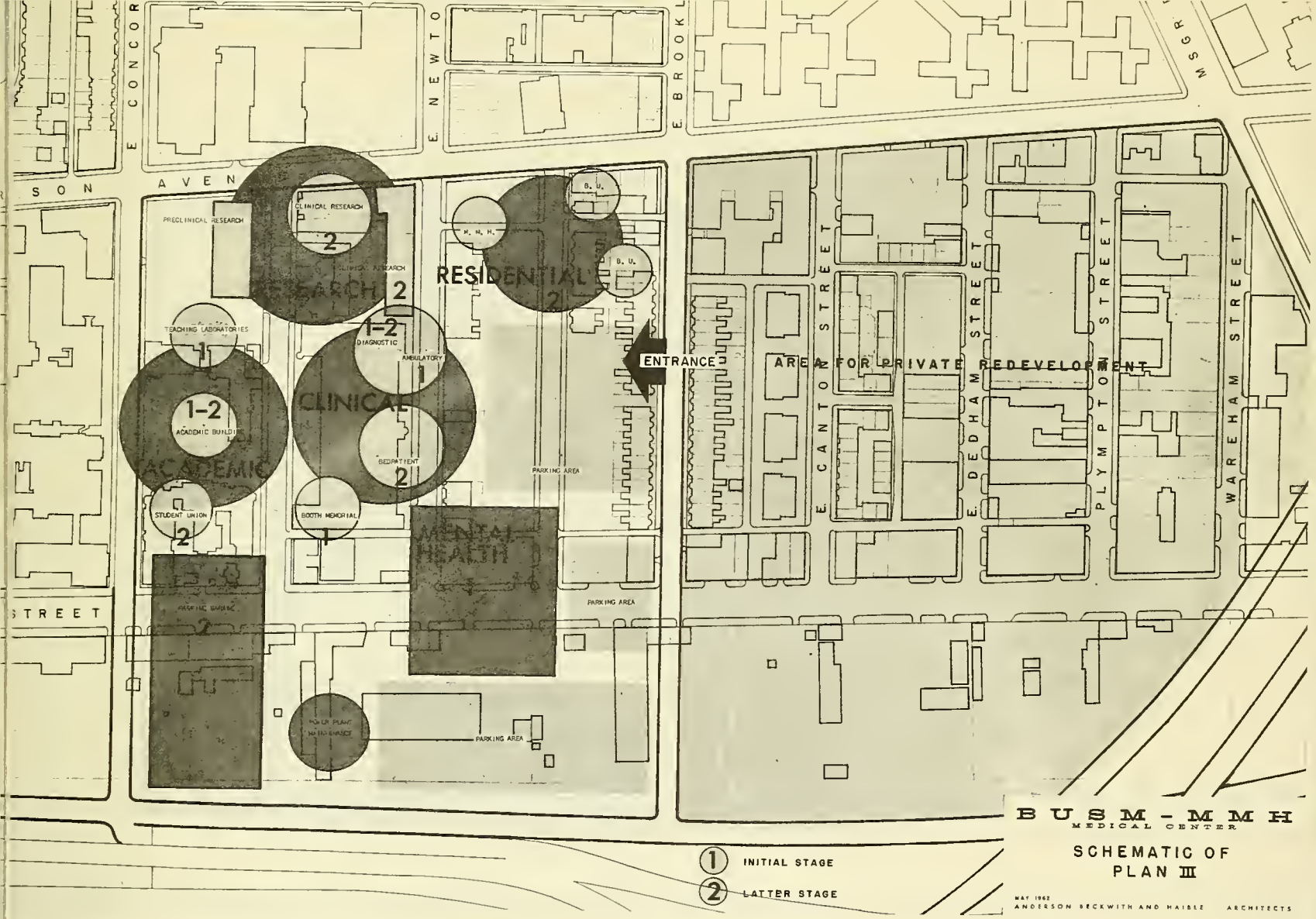

E. CONCOR
E. NEWTO
E. BROOKL
MSGR
AVEN
SON
STREET
PRECLINICAL RESEARCH
CLINICAL RESEARCH
2
CLINICAL RESEARCH
2
RESEARCH
2
H. N. H.
B. U.
B. U.
RESIDENTIAL
2
TEACHING LABORATORIES
1
1-2
DIAGNOSTIC
AMBULATORY
1-2
ACADEMIC BUILDING
ACADEMIC
CLINICAL
BED PATIENT
2
PARKING AREA
STUDENT UNION
2
BOOTH MEMORIAL
1
MENTAL HEALTH
PARKING GARAGE
2
POWER PLANT
MAIN ENTRANCE
PARKING AREA
PARKING AREA
ENTRANCE
AREA FOR PRIVATE REDEVELOPMENT
E. CANTON STREET
E. DEDHAM STREET
PLYMPTON STREET
WAREHAM STREET
STREET
1 INITIAL STAGE
2 LATTER STAGE
B U S M - M M H
MEDICAL CENTER
SCHEMATIC OF
PLAN III
MAY 1962
ANDERSON BECKWITH AND HAIBLE ARCHITECTS

Figure 13

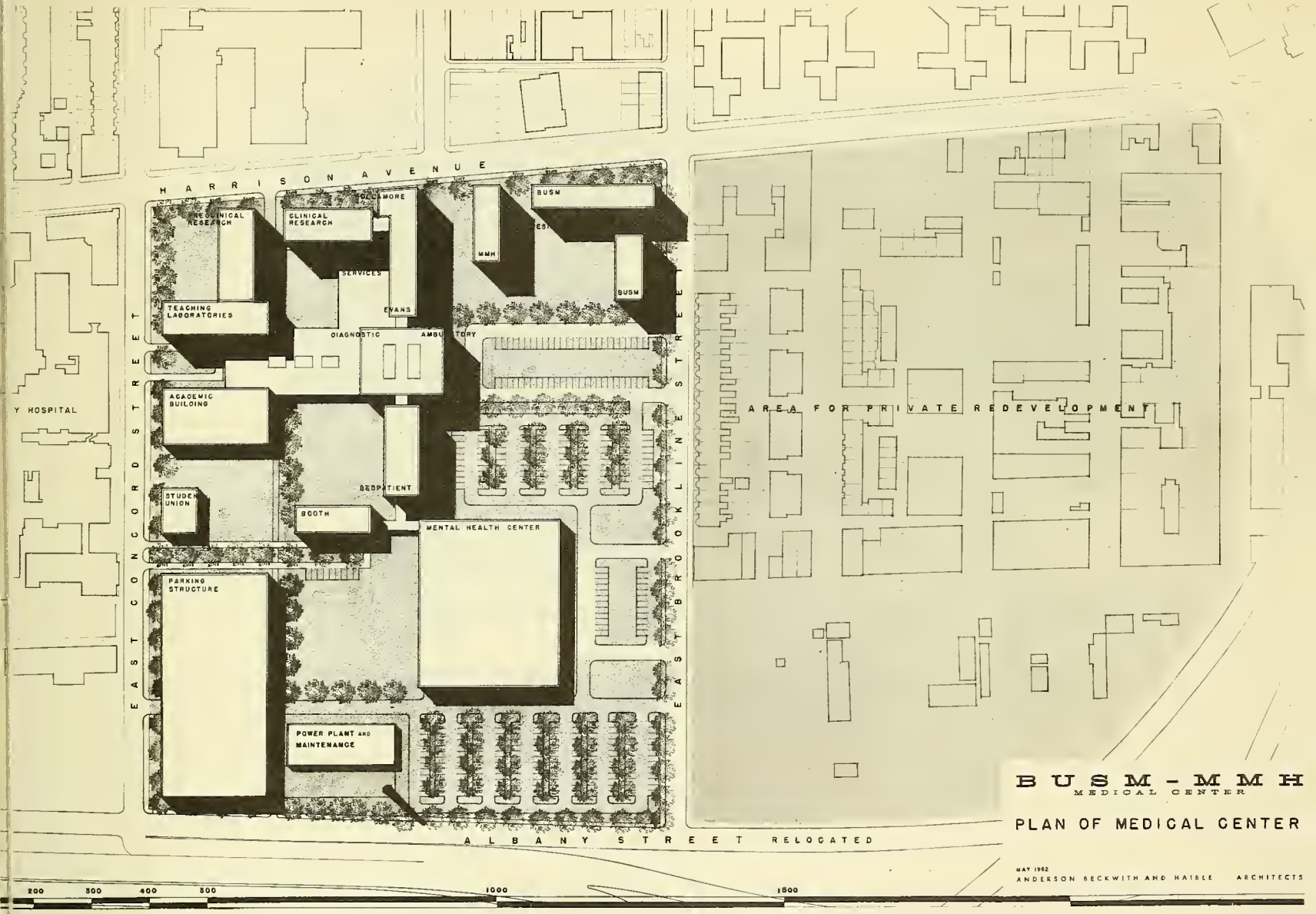

HARRISON AVENUE
SYCAMORE
CLINICAL RESEARCH
CLINICAL RESEARCH
SERVICES
BUSM
MMH
BUSM
TEACHING LABORATORIES
EVANS
DIAGNOSTIC
AMBULATORY
ACADEMIC BUILDING
STUDENT UNION
BOOTH
BED PATIENT
MENTAL HEALTH CENTER
PARKING STRUCTURE
POWER PLANT AND MAINTENANCE
EAST CONCORD STREET
EAST BROOKLINE STREET
Y HOSPITAL
AREA FOR PRIVATE REDEVELOPMENT
ALBANY STREET RELOCATED
200
300
400
500
1000
1500
BUSM - MMH
MEDICAL CENTER
PLAN OF MEDICAL CENTER
MAY 1962
ANDERSON BECKWITH AND HAIBLE ARCHITECTS

Figure 14

this scheme for the disposition of the medical institutions will bring, in the long term, substantial advantages over the alternative and more expedient plans first discussed. Execution of the best plan depends on the ability to secure the cooperation of the Boston Redevelopment Authority in their urban renewal plans for the South End, in order to assemble the site and discontinue the streets, on success in persuading the Commonwealth to make a land change for the Department of Mental Health, and on the capacity to withhold construction of ambulatory services and residential facilities until these matters have been resolved.

Long-range plans of the kind proposed in this study are only first steps toward making clear the way ahead. With determined leadership and good organization much can be accomplished once the objective is agreed upon. Continuous study and adjustment to new conditions are needed to prevent the plan from being shelved later when it may no longer seem applicable. The plan must be kept up to date with new information and new insights. Among the areas that could profitably be studied by various groups are the following:

1. A complete residential community for all medical personnel in the area.

2. Electric power, steam, refrigeration, and other utilities in systems to serve the building areas proposed in the master plan.

3. Ambulatory services program as a step toward ultimately having an ideally organized hospital.

4. Teaching laboratory building as one stage in achieving a complete medical school.

5. Land uses in adjoining areas for private redevelopment which will best enhance community values for the Medical Center.

A P P E N D I X I

TABULATIONS OF

EXISTING SPACES AND PROPOSED SPACES

A SUMMARY OF

PRECLINICAL TEACHING AND RESEARCH FACILITIES

EXISTING SPACE

Department	Academic Facilities & Services	Teaching Laboratories	Offices & Research Laboratories	Total
Medical School				
Administration	3,250			3,250
Library	3,650			3,650
General Teaching	2,800			2,800
Personnel Services	3,300			3,300
Plant Services	2,400			2,400
Nursing School				
Administration				
Library				
General Teaching				
Personnel Services				
Laboratory				
Anatomy		280	5,300	5,580
Biochemistry		370	5,300	5,670
Microbiology		2,200	4,450	6,650
Pathology		1,850	2,000	3,850
Pharmacology		550	2,500	3,050
Physiology		2,750	3,450	6,200
Animals		1,500	3,000	4,500
Net Total n.s.f.	15,400	9,500	26,000	50,900
Circulation & Mechanical	4,600	3,500	21,000	29,100
Gross Total g.s.f.	20,000	13,000	47,000	80,000

A SUMMARY OF

PRECLINICAL TEACHING AND RESEARCH FACILITIES

PROJECTED SPACE NEEDS

Department	Academic Facilities & Services	Teaching Laboratories	Offices & Research Laboratories	Total
Medical School				
Administration	5,400			5,400
Library	27,000			27,000
General Teaching	16,600	6,750		23,350
Personnel Services	7,500			7,500
Plant Services	8,700			8,700
Nursing School				
Administration		3,850		3,850
Library		Med. Sch.		
General Teaching		5,200		5,200
Personnel Services		1,950		1,950
Laboratory		2,250		2,250
Anatomy		12,800	12,000	24,800
Biochemistry		7,400	12,000	19,400
Microbiology		7,400	12,000	19,400
Pathology		7,400	12,000	19,400
Pharmacology		7,400	12,000	19,400
Physiology		7,400	12,000	19,400
Animals		7,400		7,400
Net Total n.s.f.	65,200	77,200	72,000	214,400
Circulation & Mechanical	21,500	28,500	38,000	88,000
GROSS TOTAL g.s.f.	86,700	105,700	110,000 including 30,000 new	302,400

LIST OF SPACES

ACADEMIC FACILITIES AND SERVICES

A. MEDICAL SCHOOL

Department	Existing Area		AB&H Projected Area
Administration			
Entrance and Exhib.	550		900
Medical Cent. Co-or.	600		600
Dean's Office	500		600
Assistant Dean	200		330
Financial Officer	100		330
Recorder	150		330
Registrar	300		330
Director of Adm.	50		330
Alumni Association	200		330
Secretaries	300		400
Filing Room	250		380
Vault			50
Office Supply			50
Copy Room			160
Communications Cont. room			50
Toilets	50		230
Sub-total	3,250		5,400
Library			
Reader space for 69	3,000	for 400	12,000
Books		(100,000 @ .10 sq. ft.)	10,000
Staffwork and miscellaneous	650		5,000
Sub-total	3,650		27,000

Department	Existing Area	AB&H Projected Area
MEDICAL SCHOOL--continued		
General Teaching		
Auditorium (seats 220)	2,230	(seats 500) 5,000
Classrooms	570	(3 seating 30 @ 1,000 ea.) 3,000
Seminar Rooms		(3 seating 15 @ 500 each) 1,500
Tutorial Conference		(11 @ 100 each) 1,100
Carrels		(240 @ 25) 6,000
Sub-Total	2,800	16,600
Personnel Services		
Men's Student Lounge	300	500
Locker Room 500 lockers	1,600	2,000
Women's Student Lounge	350	300
Locker Room	150	200
Men's Staff Lounge		500
Locker Room		1,000
Women's Staff Lounge		500
Locker Room		160
Snack Bar	700	700
Barber Shop	200	240
Meeting Rooms		1,000
Game Room, men and women students		400
Sub-Total	3,300	7,500
Plant Services		
Central Storage	800	4,000
Shop	850	1,500
Blower Rooms	500	2,000
Switch Gear	50	200
Boiler Room	200	1,000
Sub-Total	2,400	8,700
Net Total n.s.f.	15,400	65,200

TOTALS
ACADEMIC FACILITIES AND SERVICES

Department	Existing Area	AB&H Projected Area
MEDICAL SCHOOL		
Administration	3,250	5,400
Library	3,650	27,000
General Teaching	2,800	16,600
Personnel Services	3,300	7,500
Plant Services	2,400	8,700
Net Sub-Total n.s.f.	15,400	65,200
Circulation and Mechanical	4,600	21,500
Gross Total g.s.f.	20,000	86,700

LIST OF SPACES

OFFICES AND RESEARCH LABORATORIES

Department	Existing Area	AB&H Projected Area
Anatomy	5,300	12,000
Biochemistry	5,300	12,000
Microbiology	4,450	12,000
Pathology	2,000	12,000
Pharmacology	2,500	12,000
Physiology	3,450	12,000
Animals	3,000	
Net Total n.s.f.	26,000	72,000
Circulation and mechanical space	21,000	38,000
GROSS TOTAL g.s.f.	47,000	110,000 including 30,000 new

LIST OF SPACES

TEACHING LABORATORIES

Department	Existing Area		AB&H Projected Area
Anatomy			
Department Headquarters	180		400
Teaching Labs	shared w/ histology	(2 @ 5,400 ea)	10,800
Support Space	100		1,200
Conference			400
	280		12,800
Biochemistry			
Department Headquarters	270		400
Teaching Lab	shared w/ histology		5,400
Support Space	100		1,200
Conference			400
	370		7,400
Microbiology			
Department Headquarters	420		400
Teaching Labs	shared w/ path. 1,500		5,400
Support Space			1,200
Conference	incl. library 280		400
	2,200		7,400
Pathology			
Department Headquarters	340		400
Teaching Labs	histol/biochem path/microbiol 1,450		5,400
Support Space	60		1,200
Conference			400
	1,850		7,400

Department	Existing Area		AB&H Projected Area
Pharmacology			
Department Headquarters	280		400
Teaching Labs	shared w/ physiology		5,400
Support Space	100		1,200
Conference	170		400
	550		7,400
Physiology			
Department Headquarters	350		400
Teaching Labs	shared w/ pharm. 2,000		5,400
Support Space	400		1,200
Conference			400
	2,750		7,400
Sub-total	8,000		49,800
Animals	1,500		7,400
Lecture Rooms		(3 seating 75@ 750 each)	2,250
		(3 seating 150@ 1,500 each)	4,500
			6,750

Department	Existing Area		AB&H Projected Area
B. NURSING SCHOOL			
Administration			
School Headquarters			330
Secretaries			400
Staff private offices		10 ea @ 162 sq. ft.	1,620
Staff semi-private offices		10 @ 150 ea.	1,500
			3,850
Laboratories			2,250
Library in medical school library			
10,000 titles at .10 sq. ft.	1,000		
reader space for 60	1,800		
work space	400		
Sub-total included in Med. School Library sub-total	3,200		
General teaching space			5,200
Personnel Services			
Student Lounge			400
Locker Room			1,200
Snack dispensing machines			50
Games			300
			1,950
Plant Services -- shared with medical school.			
Net Total n.s.f.			13,250

TOTALS

TEACHING LABORATORIES

Department	Existing Area	AB&H Projected Area
Anatomy	280	12,800
Biochemistry	370	7,400
Microbiology	2,200	7,400
Pathology	1,850	7,400
Pharmacology	550	7,400
Physiology	2,750	7,400
Animals	1,500	7,400
Lecture Rooms		6,750
Nursing School		13,250
Net Total n.s.f.	9,500	77,200
Circulation and Mechanical Space	3,500	28,500
Gross Total n.s.f.	13,000	105,700

A SUMMARY OF

PATIENT CARE

AND CLINICAL RESEARCH

EXISTING SPACE

Department	Research	Bed Care & Services	Ambulatory	Cent. Diag. & Treatment	Total
Medicine	25,500	11,500	20,000		57,000
Surgery	10,600	22,600	comb. w/med.		33,200
Surgical Dept.				9,700	9,700
Obstetrics	450	4,000	1,200		5,650
Delivery				3,800	3,800
Gynecology	Incl. with obst.	Incl. with surgery	Incl. with obst.		
Pediatrics	400	800			1,200
Prev. Med.		3,600			3,600
Physical Ther.				5,750	5,750
Home Med. Ser.				2,300	2,300
Psychiatric	9,800	5,400	4,200		19,400
Stomatology			2,900		2,900
X-ray & Rad. Ther.				4,150	4,150
Cardiog. & Basal Metab.				1,200	1,200
Necropsy & Histology				3,700	3,700
Service Labs				2,200	2,200
Pharmacy				1,200	1,200
Teaching Space					
Admin. & Admit.		12,050	1,200		13,250
Central Services		16,840			16,840
Personnel Serv.		660			660
Dietary Serv.		8,050			8,050
Employees Clinic			1,000		1,000
Net Total n.s.f.	46,750	85,500	30,500	34,000	196,750
Circ., Etc.	43,000	30,000	32,600	17,000	122,600
Gross Total g.s.f.	89,750	115,500	63,100	51,000	319,350

A SUMMARY OF

PATIENT CARE

AND CLINICAL RESEARCH

PROJECTED SPACE NEEDS

Department	Research	Bed Care & Services	Ambulatory	Cent. Diag. & Treatment	Total
Medicine	35,000	15,650	13,000		63,650
Surgery	10,000	21,720	15,000		46,720
Surgical Dept.				10,700	10,700
Obstetrics	2,000	4,350	2,100		8,450
Delivery				3,600	3,600
Gynecology	Incl. with obst.	4,500	Incl. with obst.		4,500
Pediatrics	2,000	8,650	2,050		12,700
Preventive Med.	2,000	4,400			6,400
Physical therapy				9,300	9,300
Home med. service				3,200	3,200
Psychiatric	10,000	4,400	4,800		19,200
Stomatology	2,000		9,250		11,250
X-ray, Rad. Ther.				7,100	7,100
Cardiog. & Basal Metab.				1,750	1,750
Necropsy & Histology				4,150	4,150
Service Labs				2,800	2,800
Pharmacy				1,550	1,550
Teaching space				4,000	4,000
Admin. & Admit.		11,460	5,450		16,910
Central Services		19,400			19,400
Personnel Serv.		4,750			4,750
Dietary Serv.		10,530			10,530
Net Total n.s.f.	63,000	109,810	51,650	48,150	272,610
Circ., Etc.	37,800	38,430	32,750	24,075	133,055
Gross Total g.s.f.	100,800	148,240	84,400	72,225	405,665

LIST OF SPACES

CENTRAL DIAGNOSTIC AND TREATMENT FACILITY
A. SERVICE CENTER SHARED BY THE INPATIENT HOSPITAL AND AMBULATORY CENTER.

Department		Existing Area		AB&H Projected Area
X-ray and Radiation Therapy				
X-ray examination		1,500	8 @ 300	2,400
Waiting room and recept.				600
Dressing Rooms		200		500
Cystoscopy				400
Library		50		100
Developing Room	manual	300	automatic	200
Film Viewing		500		400
Film Filing				250
Radioactive Material St.				150
Offices		1,300		300
Seminar Room				500
High Voltage radiation:		300		
250 KV				300
250 KV				300
500 KV				300
1000 KV				400
Sub-Total	18.6 sq.ft./bed	4,150	20 sq.ft./bed	7,100
Cardiography				
Waiting Room				200
Examining Room				100
Record Room				100
Office				350
Recording Studio				100
Developing Room				100
				950

Department		Existing Area	AB&H Projected Area
SERVICE CENTER--continued			
Basal Metabolism			
Waiting Room			250
Office			350
Examining Rooms			200
			800
Sub-Total--Card. and Bas. Met.		1,200	1,750
Necropsy and Histology			
Morgue		900	600
Autopsy			300
Specimen St.		50	100
Toilet		200	200
Tissue prep. rm.		300	350
Histology Lab.		450	600
Offices		1,800	2,000
Sub-Total	15 sq.ft./bed	3,700	4,150
Service Laboratories			
Clinical Pathology and Chemistry			1,000
Bacteriology and Serology			600
Glass Washing			400
Storage			300
Offices			500
Sub-Total		2,200	2,800
Pharmacy			
Work Room			
Solution Room			
Dispensing Room			
Sub-Total		1,200	1,500

Department	Existing Area	AB&H Projected Area
SERVICE CENTER--continued		
Preventive Medicine:		
Physical Therapy and Occupational Therapy		
Waiting Room		600
Consultation and exam rooms	600	800
Apparatus St.		200
Hydrotherapy	1,600	1,200
Physiotherapy		1,600
Conference	400	400
Locker Rooms, toilets, etc.	300	1,200
Offices	1,000	1,000
Exercise, Recrea., Ambul.	1,100	400
Occ. Ther. Workroom	750	1,000
Record Stor.		300
Supply Room		300
Finished good st.		300
Sub-Total	5,750	9,300
Home Medical Services		
Waiting Area	250	400
Secretaries	150	300
Offices	1,150	1,000
Consultation and Conf.	800	1,500
Sub-Total	2,350	3,200
Surgery		
Surgical Department 40.5 sq. ft./bed	9,700	44.5 sq.ft./bed 10,700
Obstetrics		
Delivery Department 15.6 sq. ft./bed	3,800	10.5 sq.ft./bed 3,600
General Teaching		
Classrooms		1 seating 30 1,000
Lecture Rooms		1 seating 120 1,500
Seminar Rooms		3 seating 15 @ 500 each 1,500
Sub-Total		4,000

TOTALS

CENTRAL DIAGNOSTIC AND TREATMENT FACILITY

Department	Existing Area	AB&H Projected Area
X-Ray and Radiation Therapy	4,150	7,100
Cardiography and Basal Metabolism	1,200	1,750
Necropsy and Histology	3,700	4,150
Service Laboratories	2,200	2,800
Pharmacy	1,200	1,550
Preventive Medicine		
Physical and Occupational Therapy	5,750	9,300
Home Med. Service	2,300	3,200
Surgical Dept.	9,700	10,700
Delivery Dept.	3,800	3,600
General Teaching Space		4,000
Net Total n.s.f.	34,000	48,150
Circulation, etc. assumed 50% of net total	17,000	24,075
Gross Total g.s.f.	51,000	72,225

LIST OF SPACES

RESEARCH

Department	Existing Area	AB&H Projected Area
Medicine	25,500	35,000
Surgery	10,600	10,000
Obstetrics	450	2,000
Gynecology	Inc. with Obst.	Inc. with Obst.
Pediatrics	400	2,000
Preventive Medicine		2,000
Psychiatric	9,800	10,000
Stomatology		2,000
Net Total n.s.f.	46,750	63,000
Circ. Etc.	43,000	37,800
Gross Total g.s.f.	89,750	100,800

LIST OF SPACES

AMBULATORY SERVICES

Department	Existing Area	AB&H Projected Area
Central Diagnostic and Treatment Facilities Shared with Inpatient Hospital		
X-Ray and Radiation Therapy		
Cardiography		
Basal Metabolism		
Necropsy and Histology		
Service Laboratories		
Pharmacy		
Preventive Medicine		
Physical Therapy		
Occupational Therapy		
Home Medical Service		
(Social Work)		
Administration		
Business Office		350
Assistant Director's Office		350
Director's Office		400
Chief Nurse's Office		350
Supplies		200
Toilet		300
		1,950
Social Services, Preventive Medicine-- Home Med. Service, and Gen. Teaching-- see Cent. Diag. and Treatment.		
Patient Admitting		
Record Room	380	400
Registration	350	800
Gen. Exam. Rooms	350	1,800
Clothes St.	60	200
Toilet	60	300
	1,200	3,500
Sub-Total--Admin., Patient Admitting	1,200	5,450

Department	Existing Area		AB&H Projected Area
AMBULATORY SERVICES--continued			
Medical and Surgical--(eyes, dermatology, urology; neurosurgery, neurology, hypertension; gastro-intestinal, rectal, thoracic; tumors-cancer, endocrinology, orthopedics. Cardiovascular, metabolism-diabetic, and hematology are included under Central Diagnostic and Treatment Facilities.)			
Medical Associates	12,000		
Departmental Admin.			600
Exam. rooms			18,760
Support Space			2,680
Consultation Offices			5,360
Conference rooms		2 @ 300 each	600
		medicine 13,000	
		surgery 15,000	
	20,000	117 stations	28,000
Obstetrics and Gynecology			
Departmental Administration			350
Examination rooms			1,000
Support Space			150
Consultation Offices			300
Conference Room		share with ped.	300
	1,200	8 stations	2,100
Pediatrics			
Department Administration			350
Examination rooms			1,200
Support Space			170
Consultation Offices			330
Conference Room		shared with obs. and gyn.	
		8 stations	2,050

Preventive Medicine--(Home medical service, Hydrotherapy, physiotherapy, occupational therapy.) See Central Diagnostic and Treatment Facilities.

Department	Existing Area		AB&H Projected Area
AMBULATORY SERVICES--continued			
Stomatology--(Orthodontics, endodentics, periodontology, oral surgery.)			
Department Administration			350
Examination rooms			6,000
Support Space			900
Consultation Offices			1,700
Conference Room			300
	2,900	40 stations	9,250
Psychiatry--(Child psychiatry, psychosomatic medicine.)			
Department Administration			350
Examination rooms			3,000
Support Space			450
Consultation Offices			700
Conference Room			300
	4,200	20 stations	4,800
Sub-Total--Clinics	28,300	193 stations	46,200
Employees' Clinic	1,000		
TOTALS AMBULATORY SERVICES			
Administration and admitting	1,200		5,450
Clinics	28,300		46,200
Employees clinic	1,000		
Net Total n.s.f.	30,500		51,650
Clinical waiting areas	11,600	97 sq. ft./sta.	18,750
Services, walls and circulation measured	21,000	assumed 20% n.t.	14,000
Gross Total g.s.f.	63,100		84,400

LIST OF SPACES

BED CARE AND SERVICE FACILITIES

Department	Existing Area		AB&H Projected Area
Administration			
Lobby and waiting room, several totaling	2,300		1,000
Information recep.	50		50
Telephone equipment	500		
Accounting office	1,400		1,000
Private office--Business	*		330
Vault			50
Supply Cl.			50
Copy Room			
Cashier	*		160
Admitting and Interviews	*	9 rms. @ 60	540
Retiring			100
Director of Nursing	*		330
Administrator and Sec.	*		450
Medical Records St.	700		1,000
General Accountant St.	1,100		1,000
Conference Room	*		400
Toilets			300
Gift Shop	250		350
Gift Shop St.	100		150
Coffee Shop	700		800
Coffee Shop St.	100		100
Social Service--see Cent. Diag. & Treatment, Preventive Medicine--Home Med. Service			
Offices--Department Headquarters	2,500		2,650
Spaces above marked *	2,000		
	11,700		10,810
Admitting			
Vestibule	300		300
Office			80
Examination Room			150
Bathroom			60
Oxygen Room	50		60
	350		650
Sub-Total	12,050		11,460

Department	Existing Area	AB&H Projected Area
BED CARE AND SERVICE FACILITIES--continued		
Central Services		
Blood Bank		150
Sterile St.		700
Central Sterilizing		1,500
Receiving	370	600
Central Maintenance Shops	10,000	10,000
General St.	2,890	5,000
Med. Record Storage	3,200	1,000
Cold Storage	200	250
Mail Room	180	200
Sub-Total	16,840	19,400
Personnel Services		
Doctors' Locker room		1,000
Nurses' Lounge		500
Nurses' Locker room		1,000
Female Help Locker room		600
Male Aides' Locker room	160	500
Doctors' Lounge		750
Library		400
Miscellaneous Facilities	500	
Sub-Total	660	4,750
Dietary Services		
Dietician's office	50	330
Dining and serving space	5,000	6,000
Refrigerators		
Storage		
Dishwash		
Central Kitchen	3,000	4,200
Bakery		
Ward Kitchen, etc.		incl. in nursing areas
Sub-Total	8,050	10,530

Department		Existing Area		AB&H Projected Area
BED CARE AND SERVICE FACILITIES--continued				
Medicine		68 beds	86 beds, 4 nursing units	
Patient Area				10,300
Support Space				3,000
Solaria and Visitors				2,000
Treatment Rooms				350
	170 sq.ft./bed	11,500	181 sq.ft./bed	15,650
Surgery (plus existing gynecology)	100 beds surgery + 16 beds gynecology		120 beds, 5 nursing units	
Patient Area				14,400
Support Space				4,200
Solaria and Visitors				2,640
Treatment Room				480
	195 sq.ft./bed	22,600	181 st.ft./bed	21,720
Obstetrics		24 beds	24 beds, 1 nursing unit	
Patient Care				2,880
Support Space				840
Solaria and Visitors				530
Treatment				100
	168 sq.ft./bed	4,000	181 sq.ft./bed	4,350
Gynecology		16 beds included in exist. surg.	24 beds, 1 nursing unit	
Patient Care				3,000
Support Space				900
Solaria and Visitors				500
Treatment				100
	incl. with surgery		181 sq. ft./bed	4,500

Department	Existing Area		AB&H Projected Area
BED CARE AND SERVICE FACILITIES--continued			
Pediatrics	(Boston City Hospital)	48 beds, 2 nursing units	
Patient Care			5,750
Support Space			1,700
Solaria and Visitors			1,000
Treatment			200
in MMH	800	181 sq.ft./bed	8,650
Preventive Med.	16 beds	24 beds, 1 nursing unit	
See Cent. Diag. and Treatment			
Patient Care			3,000
Support Space			800
Solaria and Visitors			500
Treatment			100
226 sq.ft./bed	3,600	181 sq.ft./bed	4,400
Psychiatric	16 beds	24 beds, 1 nursing unit	
Patient Care			3,000
Support Space			800
Solaria and Visitors			500
Treatment			100
332 sq.ft./bed	5,400	181 sq.ft./bed	4,400
Sub-Total--Bed Care			
240 beds	47,900	350 beds, 15 nursing units	63,670
BED CARE AND SERVICE FACILITIES	TOTALS		
Administration	11,700		10,810
Admitting	350		650
Central Services	16,840		19,400
Personnel Services	660		4,750
Dietary Services	8,050		10,530
Patient Care	47,900		63,670
Net Total n.s.f.	85,500		109,810
Circulation, etc.	30,000		38,430
Gross Total g.s.f.	115,500		148,240

O T H E R F A C I L I T I E S

EXISTING SPACES

Department	Total g.s.f.
Power Plant	5,000

O T H E R F A C I L I T I E S

PROPOSED SPACE NEEDS

Department	Total g.s.f.
Power Plant and Maintenance	12,600
Mental Health	280,000
Booth Memorial	25,000
Parking Structure (230 cars)	80,000
Total	397,600

APPENDIX II
(See Figure 10)

Trust, Corporate and Individuals Holding
more than One Parcel

1. Legarde, Anthony F., Antoinette A.
2. Amaro, Luigi, and Salvatore
3. Chaletsky, Norman A.
4. American Oil Co. of Maryland
5. Maloof, Maddie and Billy, Kamaar and Mary
6. Griffin, Walter P., Trustee
7. Slater, Joseph, Sadie, Kathleen
8. Transdisc Corp. of Boston
9. Morad, Michael and Madera, Trustees
10. 700 Harrison Avenue, Inc. (Star Brush)
11. Boston Chemical Industries, Inc.
12. Wolpert, Nathan I., Trustee
13. Oshry, Harry and Minnie
14. Eden Apartments
15. Ginsberg, Bernard and Gerald
16. Suffolk Management Corp.
17. Boole Realty Corp.
18. Hoge's Windows, Inc.
19. Bowman, Ivy B.
20. Sherman Realty Trust
21. Cerigliano, Josephine
22. California Oil Co., of Delaware
23. Mower, Samuel and Mary
24. North Coast Realty Co., Inc.
25. Scott and McDonald, Inc.
26. Shepard, Bruce and Thomas, Trustees
27. E. L. Caldwell Co.
28. Graham, Joseph and Frank
29. Salami, Philomena, Foran, Nichols, and Weston, Mary E.
30. Cohn, Richard M.
31. Wood Specialties Co., Inc.

APPENDIX II--continued

32. M. J. Flaherty Co.
33. Allen, Leo
34. Paul, Marion
35. Freegold Corp.
36. Reliance Realty Corp.
37. Feldman, Lena and Ida
38. Badger, E. Franklin and Raymond M.
39. Furman, Jacob and Anne, Trustees
40. W. L. Mead, Inc.
41. Cowan Lumber Co.
42. Kondel Bros.
43. Kepnes, Abraham
44. Stamotos, Nicholas
45. Vinios, Asino S.
46. Mitchell, Christopher
47. Cogi Realty Company
48. Fornaro, Margaret E.
49. Elia, Nago and Demitra
50. Alario, Leo and Rachel
51. Miller, Rose
52. Barry, Lorraine
53. O'Brien, Fanny
54. Quattlebaum, Howard and Annette
55. Lung, Richard
56. Hockman, Cook and Fortune, Inc.
57. Kenyon, Herford and Margaret
58. Connolly, James
59. South Cove Associates
60. Mehegan, Charles and Rose
61. Baboran, Guregh and Mary
62. City Spa Cafeteria
63. Driscoll, Ann
64. Handy, Helen and Alice